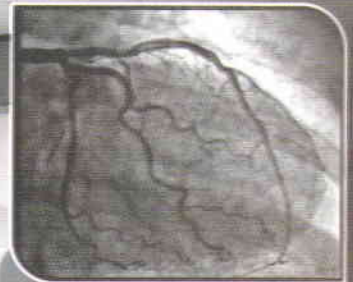


Surgical Radiology



Dr. Mohammed El-Matary

MATARY
SURGERY

*New
edition*

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First Edition 2006

Second Edition 2008

Third Edition (New Edition) 2011

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Dedication

*Allah the all merciful, I beg Thee
To accept this effort
For the soul of my mother
She was your gift for me*

Acknowledgement

The author wishes to acknowledge with gratitude all those who had helped in preparation and production of this book & who have contributed with their suggestions and ideas for the new edition:

Ahmed Abdel-Majeed, M.B.B.Ch

Ain Shams University

Kareem Mohamed Ali, M.B.B.Ch

Ain Shams University

Cover design

Kareem Darweesh, M.B.B.Ch

Ain Shams University

Preface

This book provides an update for medical students who need to keep abreast of recent developments. I hope also it will be useful for those preparing for postgraduate examination.

This book is designed to provide a concise summary of knowledge about surgical radiology, which medical students and others can use as study guide by itself or with readings in current textbooks, monographs, and reviews.

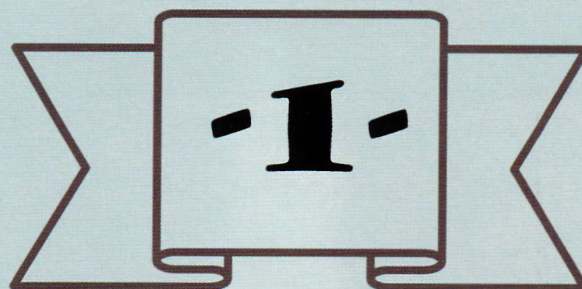
This book is written primarily for those who have some knowledge of anatomy, physiology, biochemistry and pharmacology.

The author is extremely grateful to all the contributors for the high standard of the new chapters, and hopes that you, the reader, will enjoy going through these pages as much as he had.

M. El-Matary

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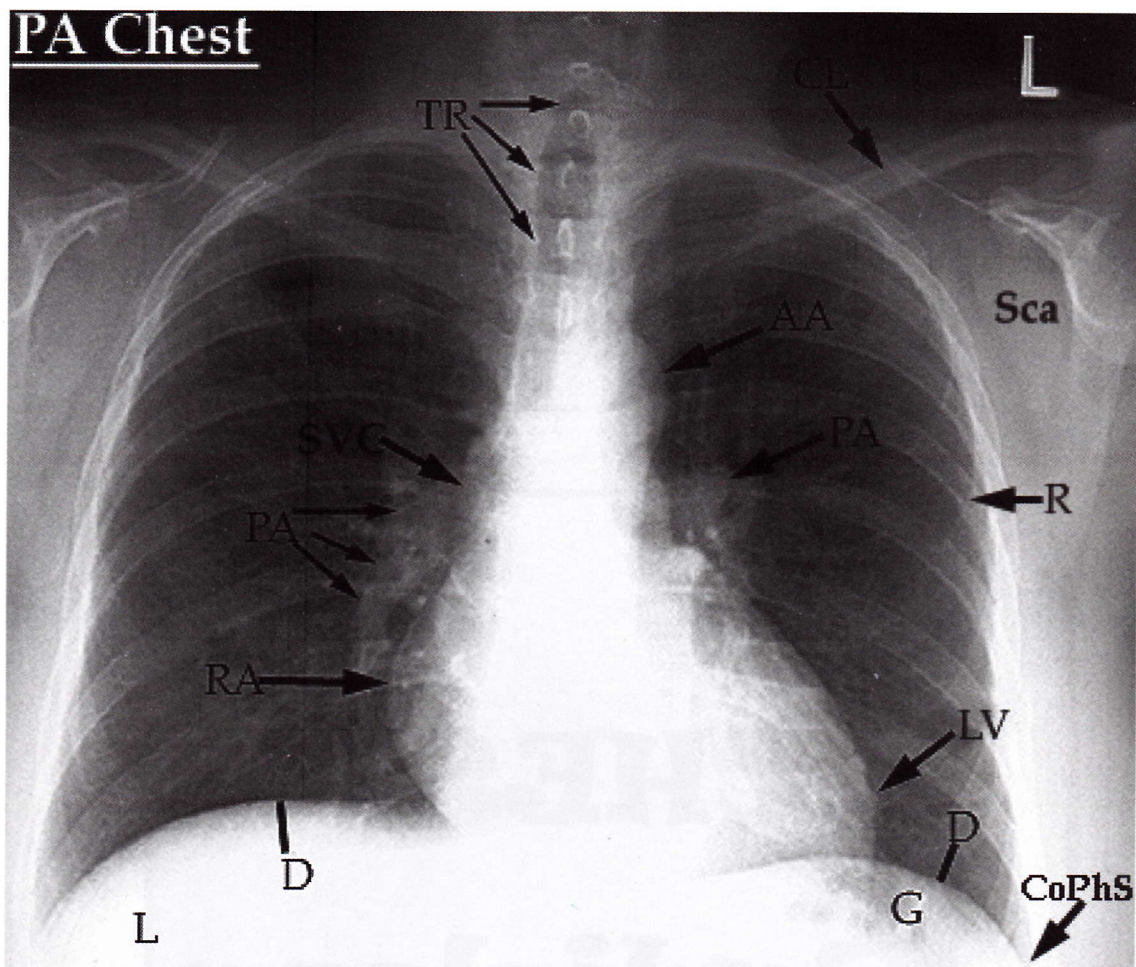
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CHEST

Radiology

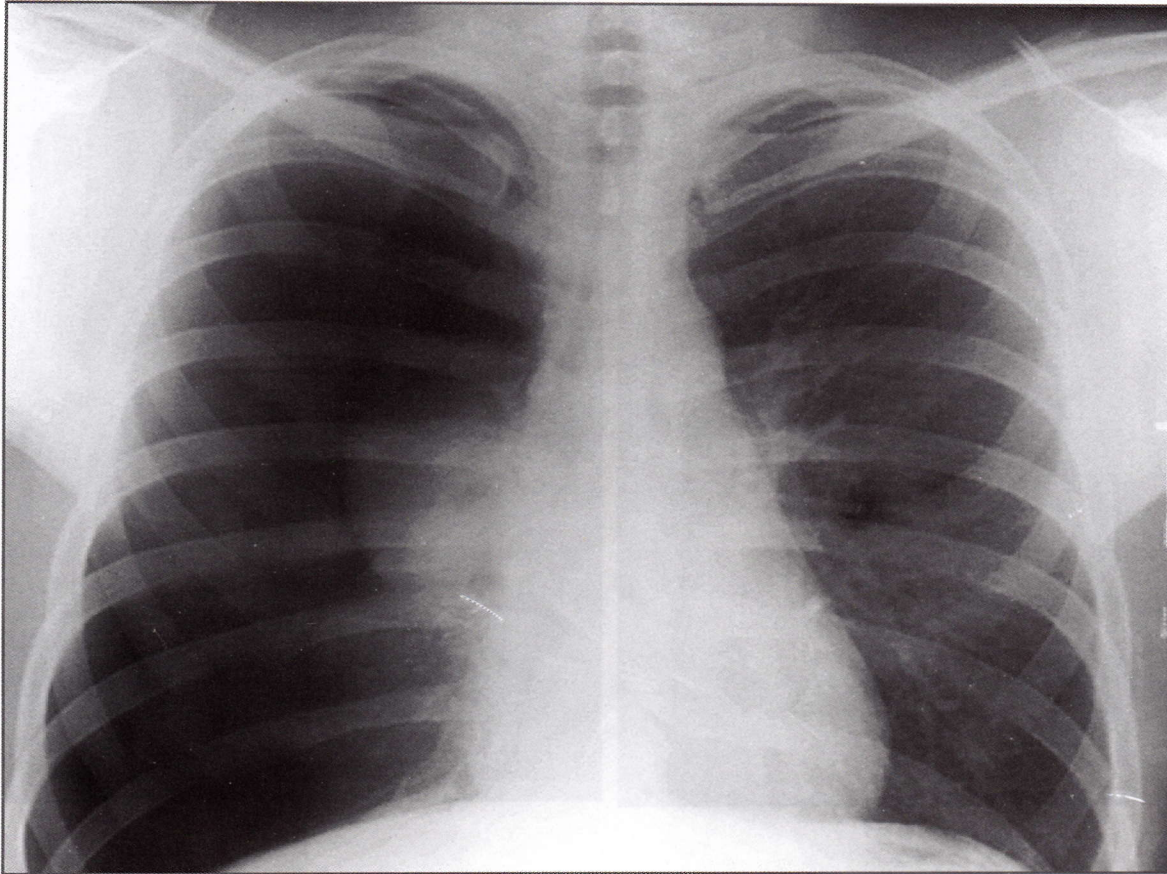
Normal Chest X-ray



➡ Note:

- Normal cardio-thoracic ratio.
- Clear lung fields.
- Clear costo-phrenic angles.
- No hilar or mediastinal abnormalities.

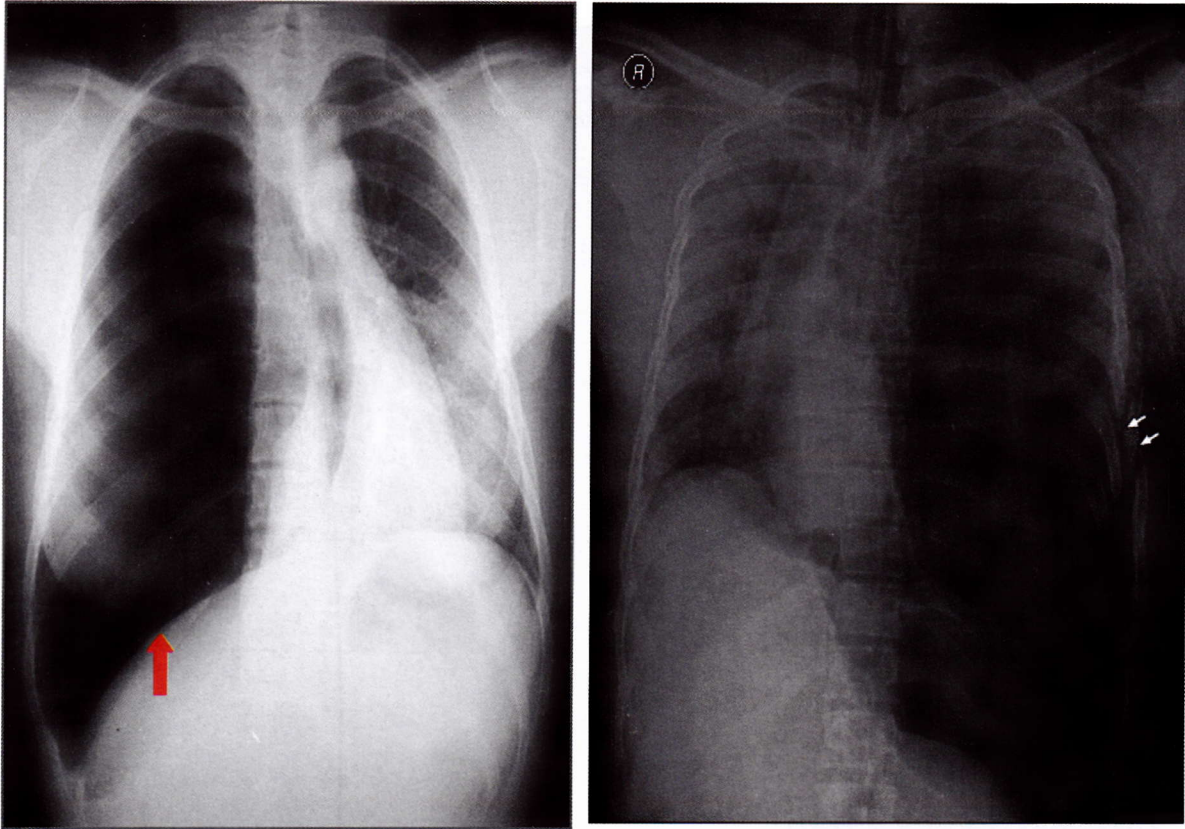
Pneumothorax



➡ **Note:**

- The lung is collapsed.
- The right pleural cavity is filled with air, which looks jet black due to absence of broncho-vascular markings of the lung.

Tension Pneumothorax



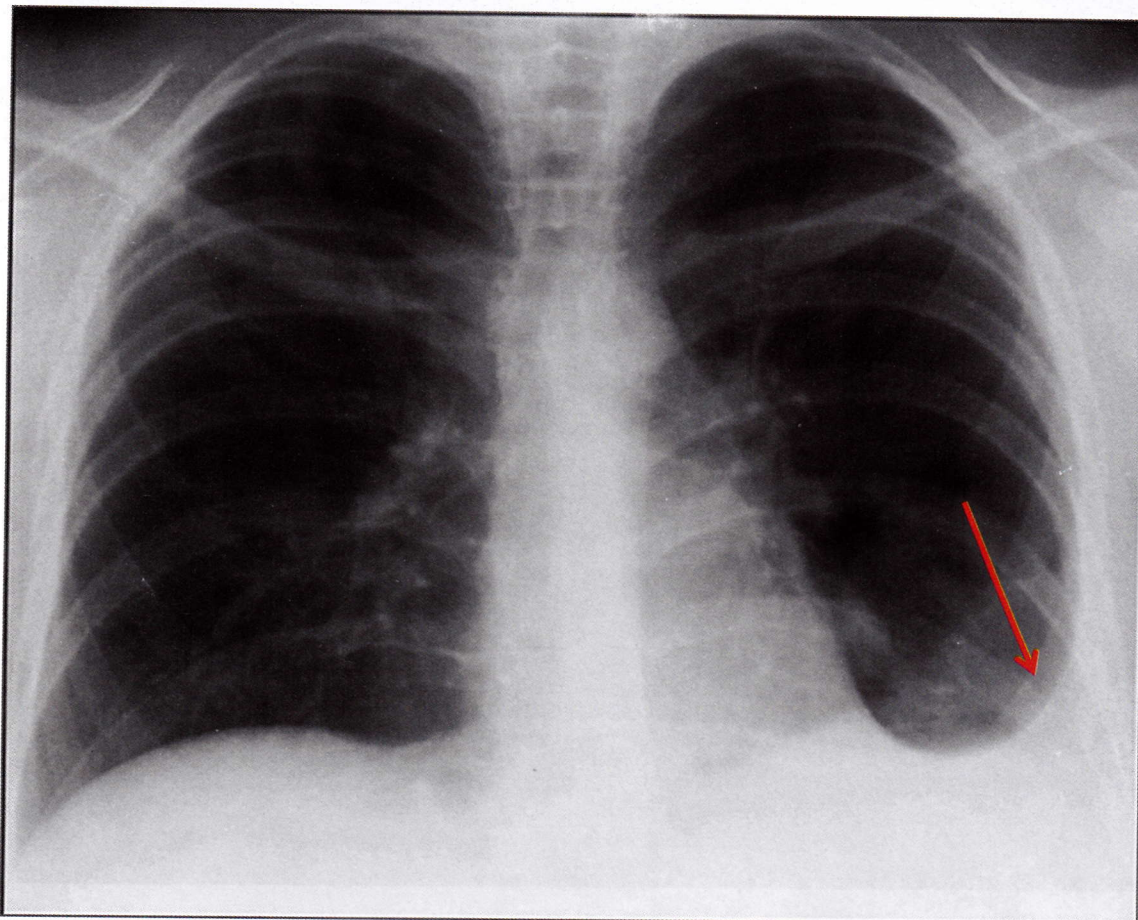
➡ **Note:**

- There is marked shift of the mediastinum to the opposite side with flattening of the diaphragm and wide intercostal spaces.

Questions

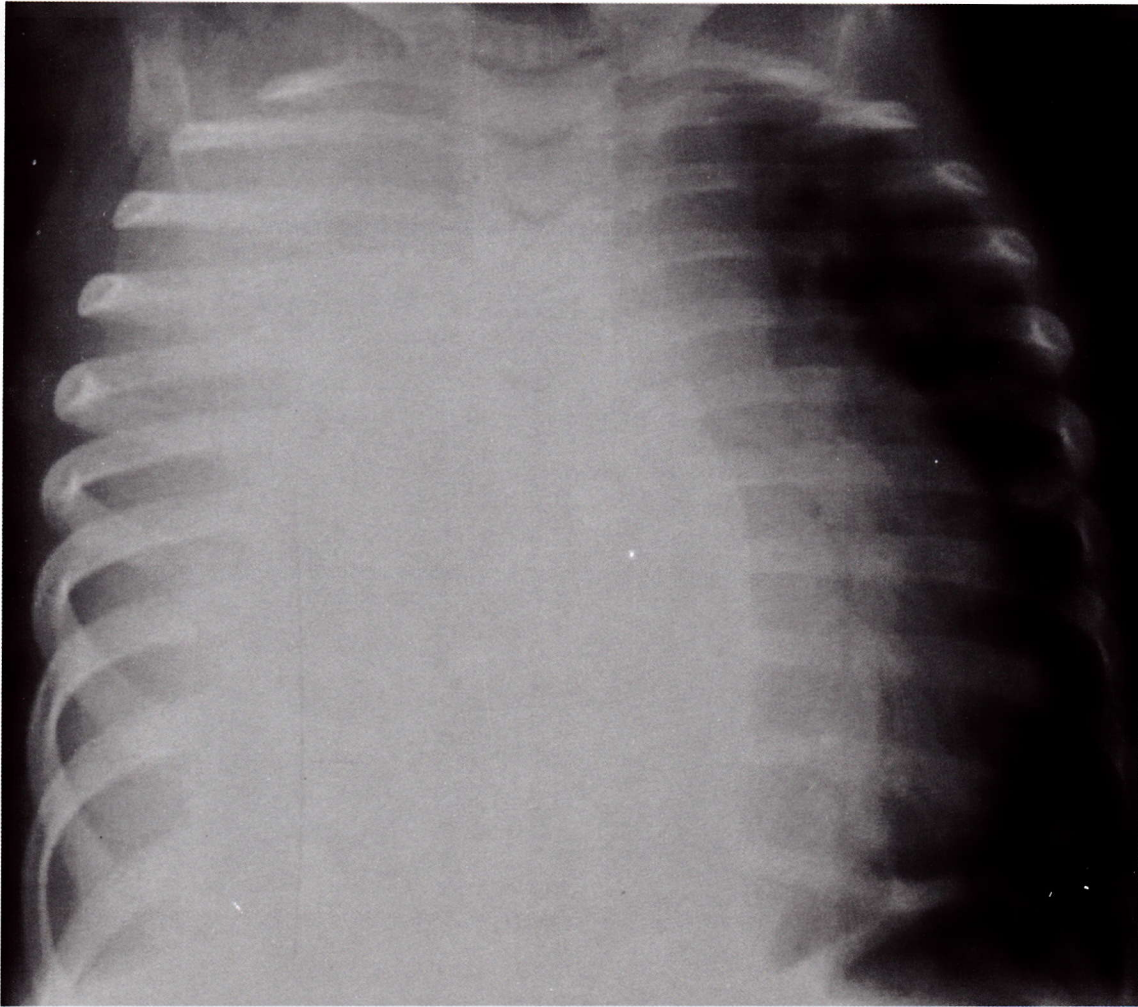
1. There is evidence of lung collapse. T
2. There is evidence of surgical emphysema. T
3. This x-ray should have not been done as this case should be diagnosed clinically and treated immediately. T
4. Clinically, there is dullness in the affected side. F
5. The first line of treatment is insertion of wide bore needle in the 2nd intercostal space in the mid-clavicular line. T

Pleural Effusion



➡ **Note:**

- Obliteration of the costo-phrenic angle with opacity rising to the axilla.



➡ **Note:**

■ Shift of mediastinum to the opposite side.

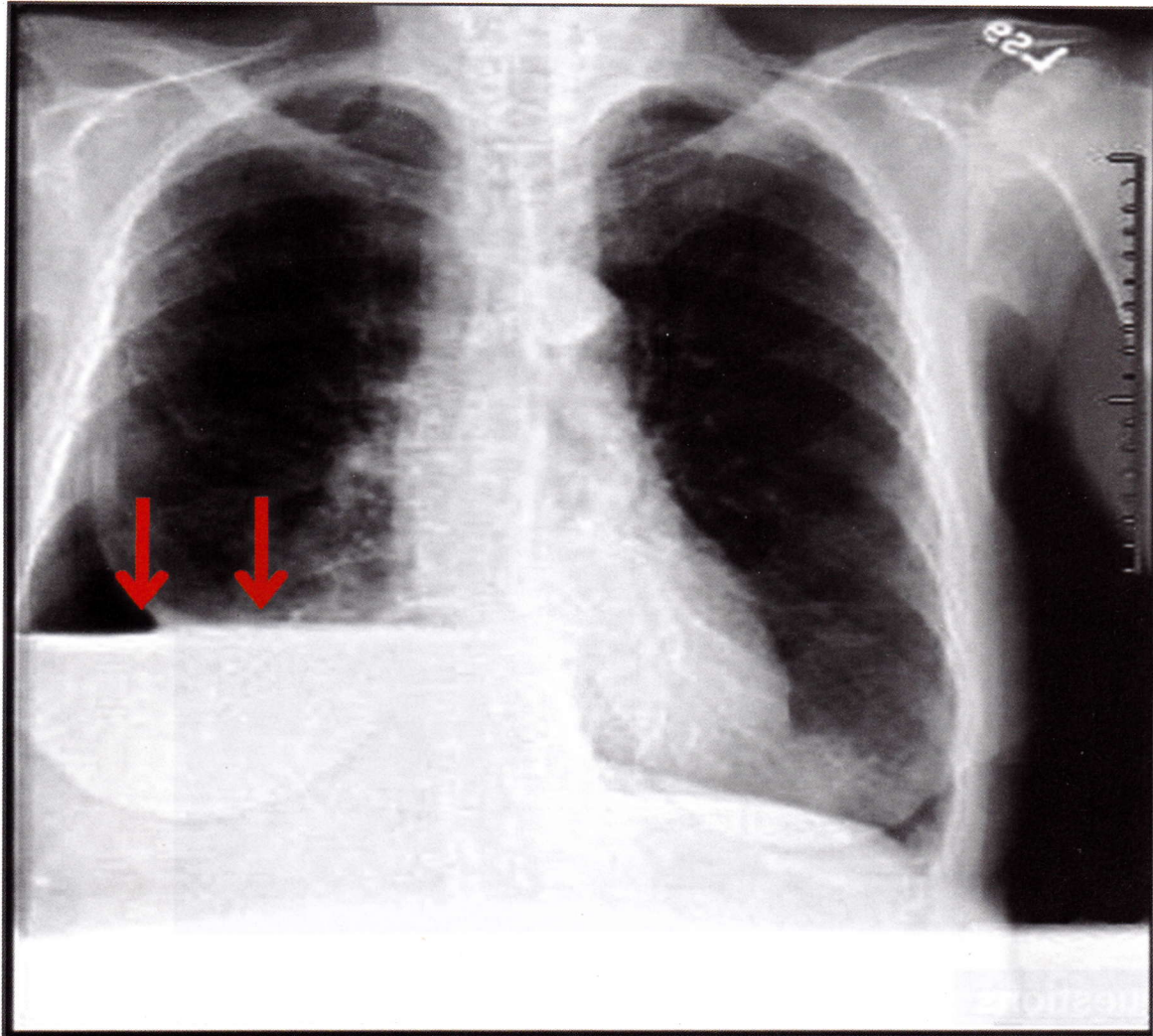
Questions

1. In massive effusion, the trachea is shifted to the same side.
2. If the mediastinum is not shifted with massive effusion, suspect malignant effusion.

F

T

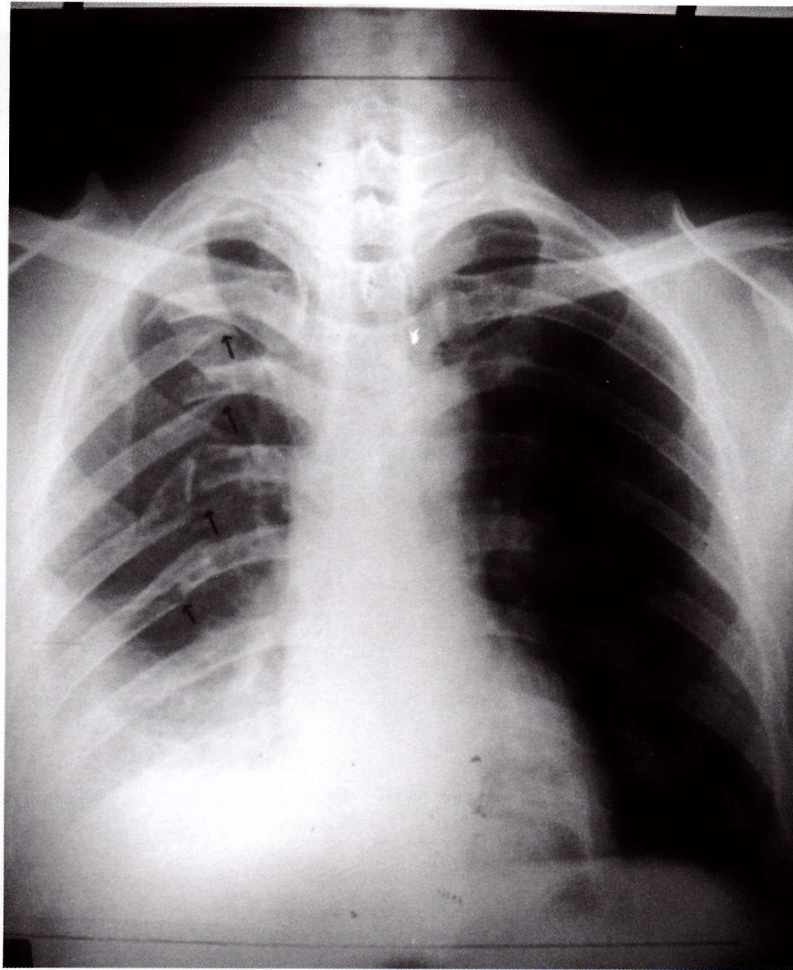
Hydro-Pneumothorax



➡ **Note:**

■ There is air fluid level seen in the pleural space.

Chest Trauma

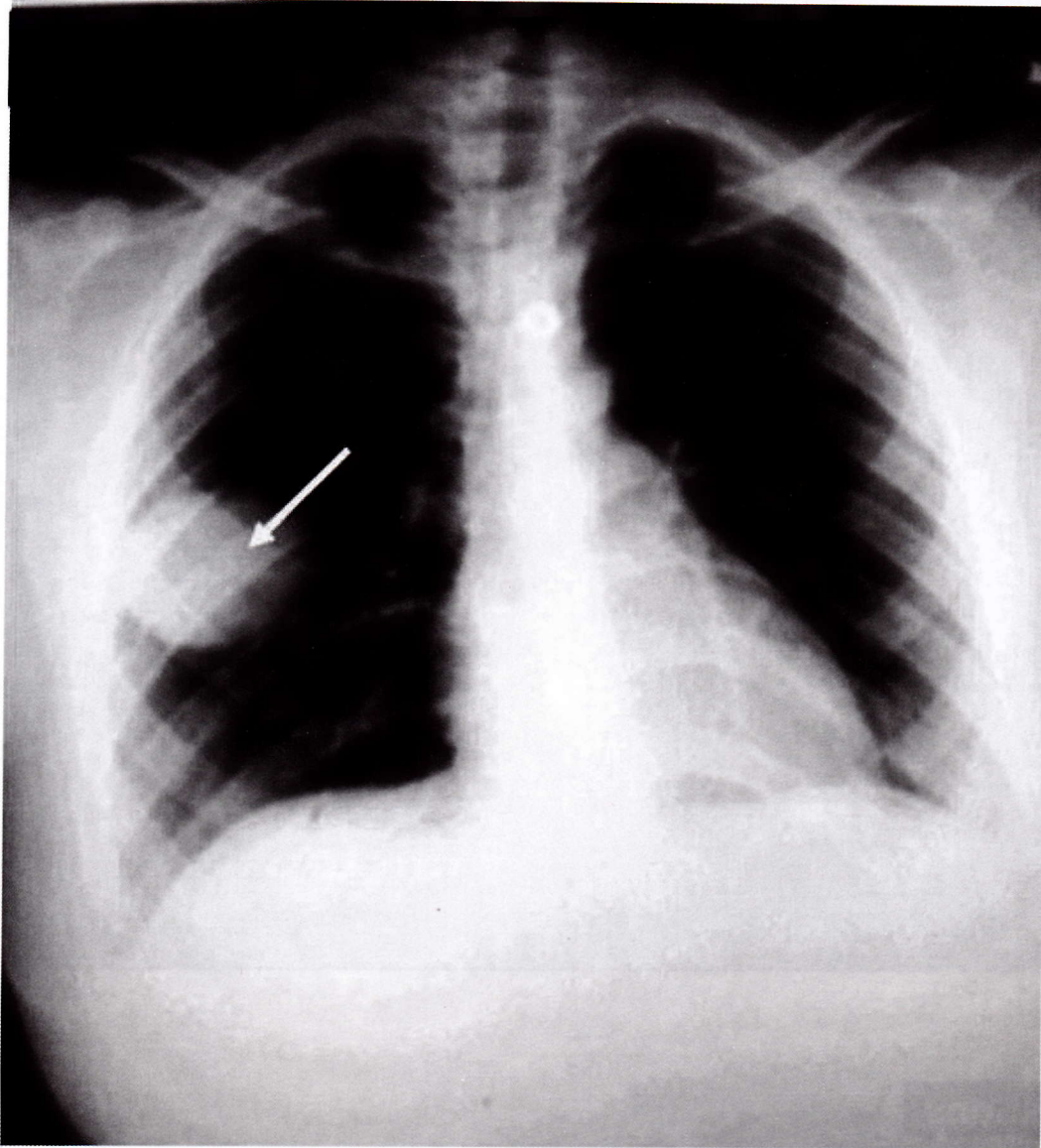


Questions

1. There is evidence of multiple rib fracture in this x-ray.
2. Hemothorax can be treated conservatively.

T
F

Coin Shadow



► **Note:**

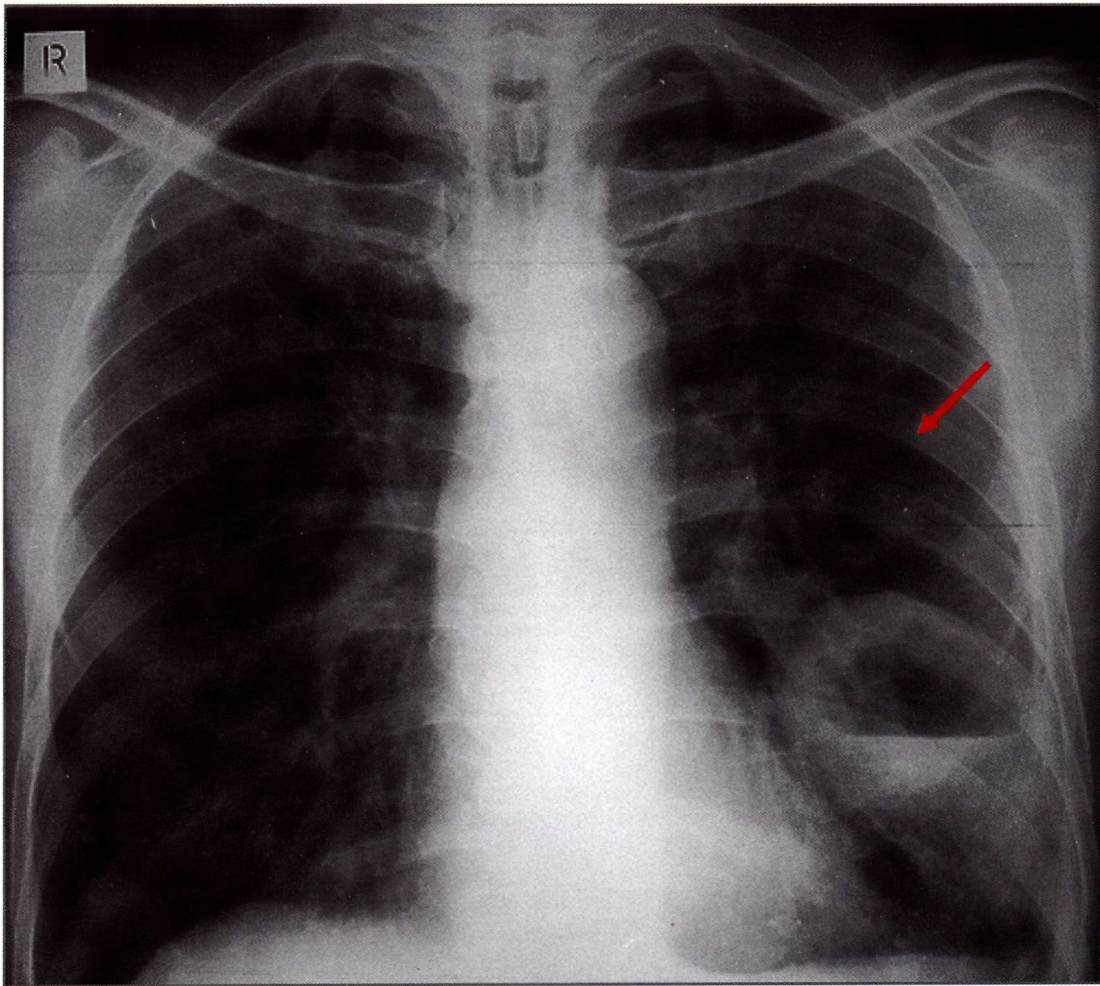
■ Differential diagnosis includes bronchogenic carcinoma, solitary metastasis, adenoma, lung cyst & lung abscess.

Questions

1. This lesion may cause Dyspnea, hemoptesis & wheezes.
2. Trachea is central.
3. This lesion is definitely bronchogenic carcinoma.
4. Biopsy is indicated.

T
T
F
T

Cavitory Lung Lesion

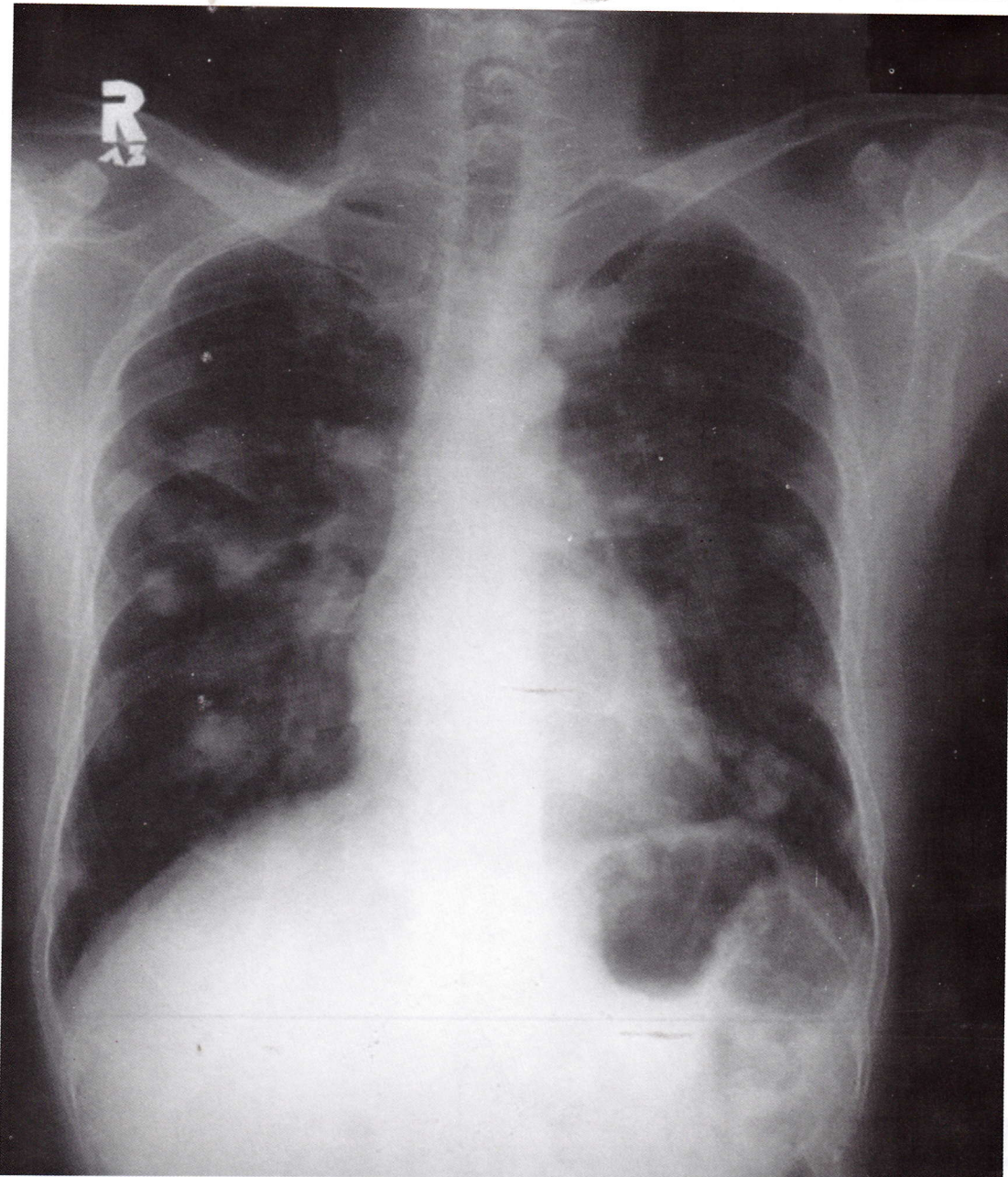


Questions

1. Appearance of air fluid level suggestive of lung abscess.
2. This lesion can be bronchogenic carcinoma.

T
T

Multiple Pulmonary Metastasis

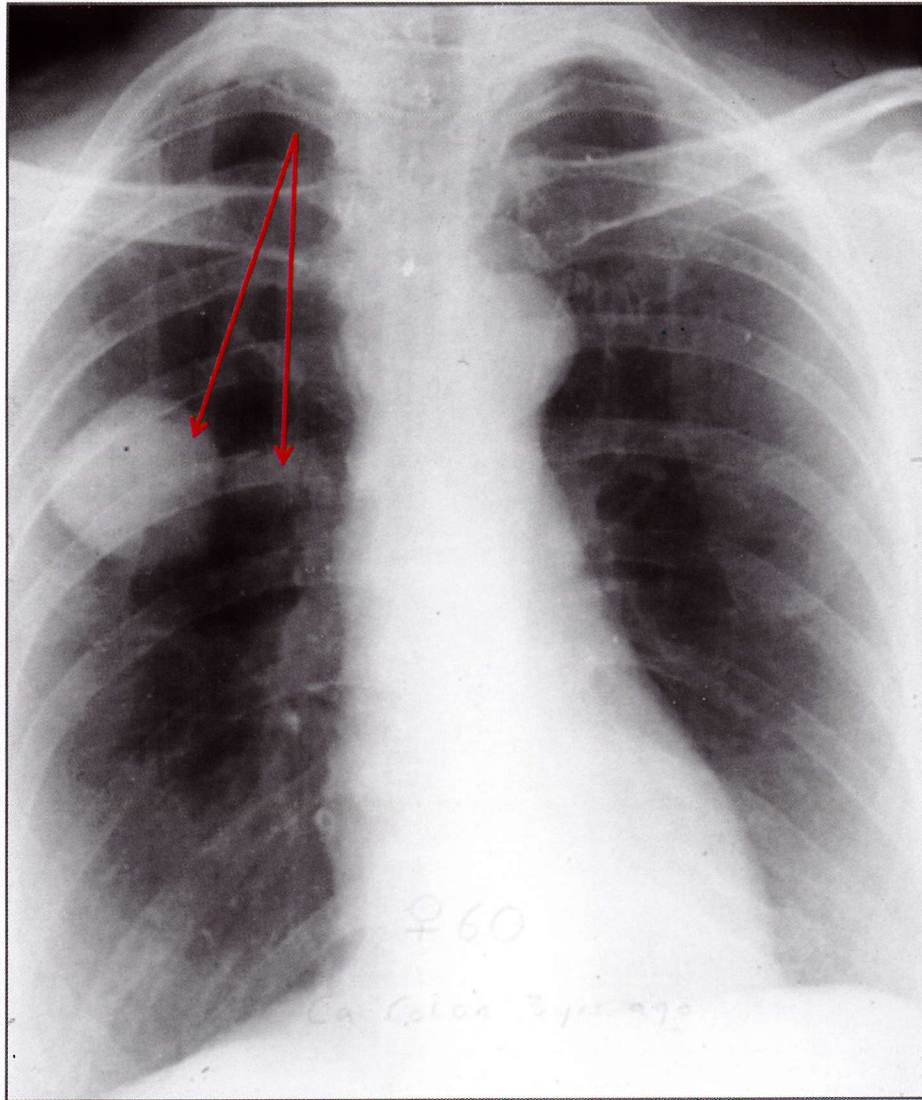


Questions

1. Fluffy cotton appearance is a characteristic radiological sign.
2. The underlying cause may be cancer breast.
3. Palliative treatment is the treatment of choice.

T
T
T

Cannon Ball Metastasis



Questions

1. This lesion may be due to cancer colon.
2. This lesion may be due to hypernephroma or seminoma.

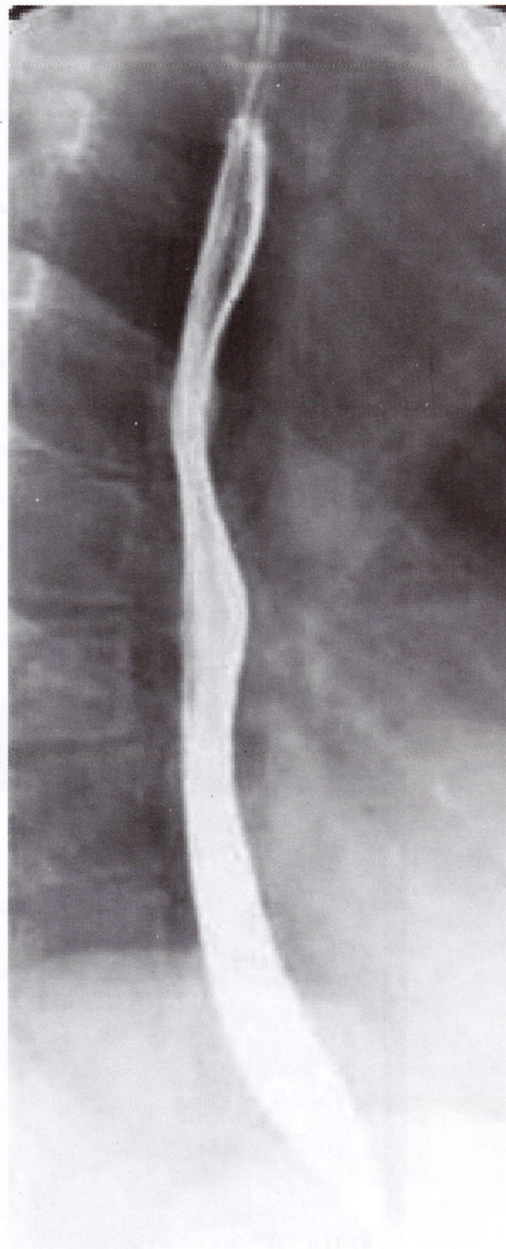
T
T

-2-

Esophagus Radiology

Normal Esophagus

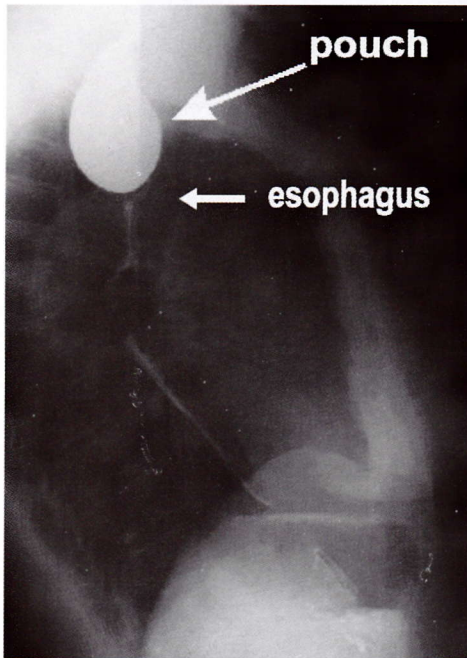
■ Barium swallow



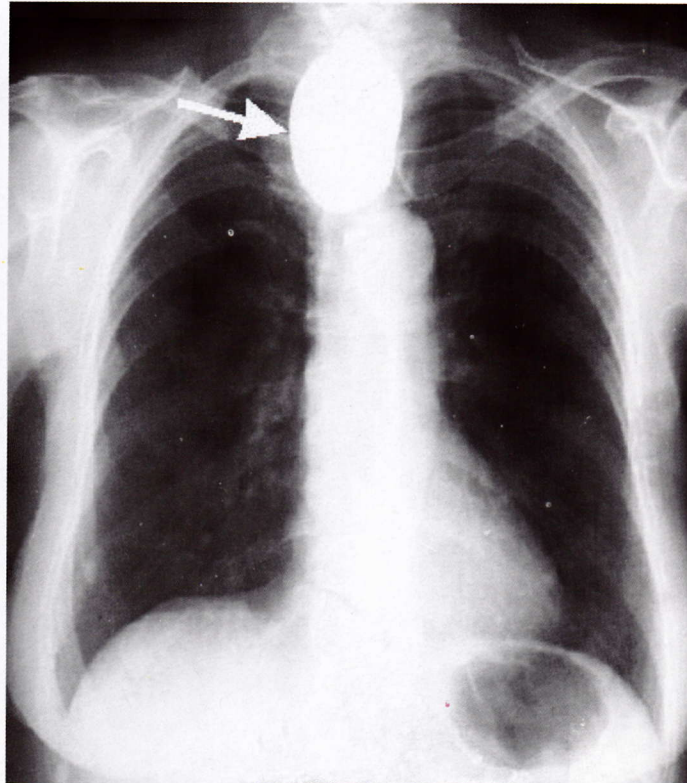
➡ **Note:**

■ Double contrast.

Pharyngeal Pouch



Lateral view



PA view

➡ **Note:**

- Well defined pouch filled with barium with rounded borders at the root of neck.

Questions

1. This diverticulum is known as Zencker's diverticulum.
2. The underlying cause is neuro-muscular incoordination.
3. Male to female ratio is 5:1.
4. Patient usually presents by dysphagia.
5. Carcinoma may develop within the pouch.
6. Cricomyotomy is the line of treatment in early cases.

T
T
T
T
T
T

Congenital Esophageal Atresia



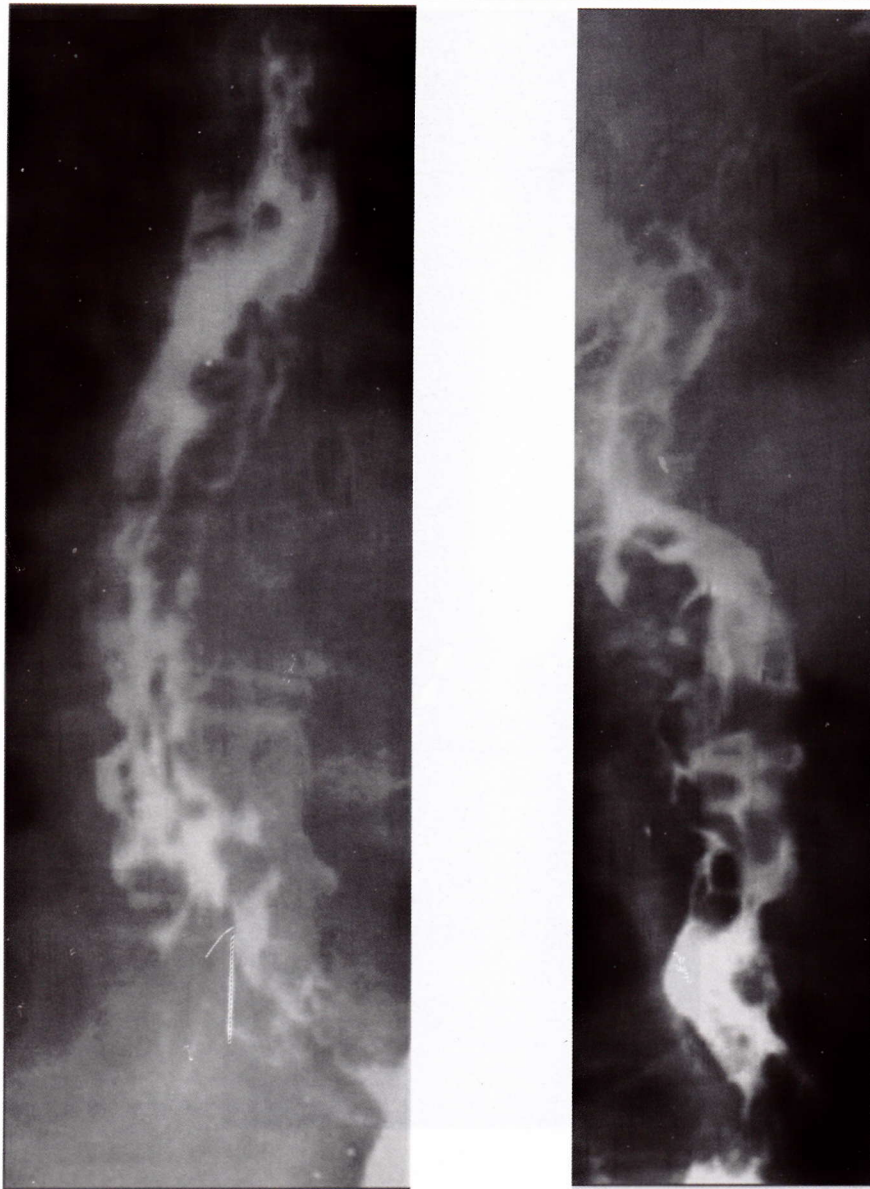
► **Notes:**

- Arrest of lipidol dye in the chest → blind upper esophageal pouch.
- Presence of gastric air bubble is suggestive of lower esophageal fistula with the trachea.

Questions

1. This study is made using gastrograffine. F
2. This abnormality is commonly associated with other congenital anomalies. T
3. The main presentation of this patient is excessive salivation. T
4. This patient may suffer from chest infection. T
5. This abnormality is treated by ligation & restoration of esophagus. T

Esophageal Varices



► **Note:**

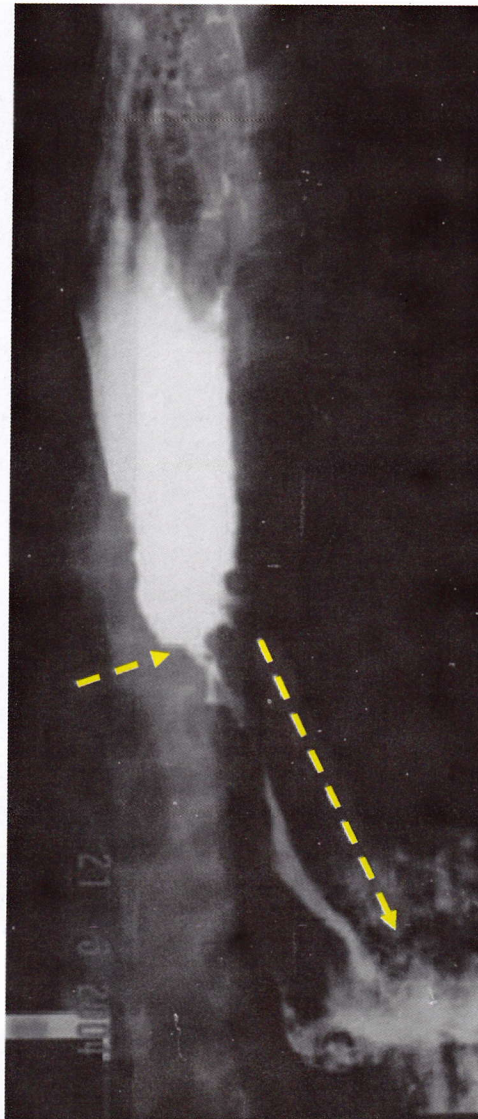
- Multiple smooth filling defects in the lower $\frac{2}{3}$ of the esophagus & irregular contour of the esophagus.

Questions

1. This patient presents mainly by hematemesis.
2. This condition is not commonly associated with secondary piles.
3. This patient may present with left upper abdominal mass.
4. Abdominal US is an essential investigation for this patient.
5. The principle line of treatment is injection sclerotherapy.

T
F
T
T
T

Cancer Esophagus



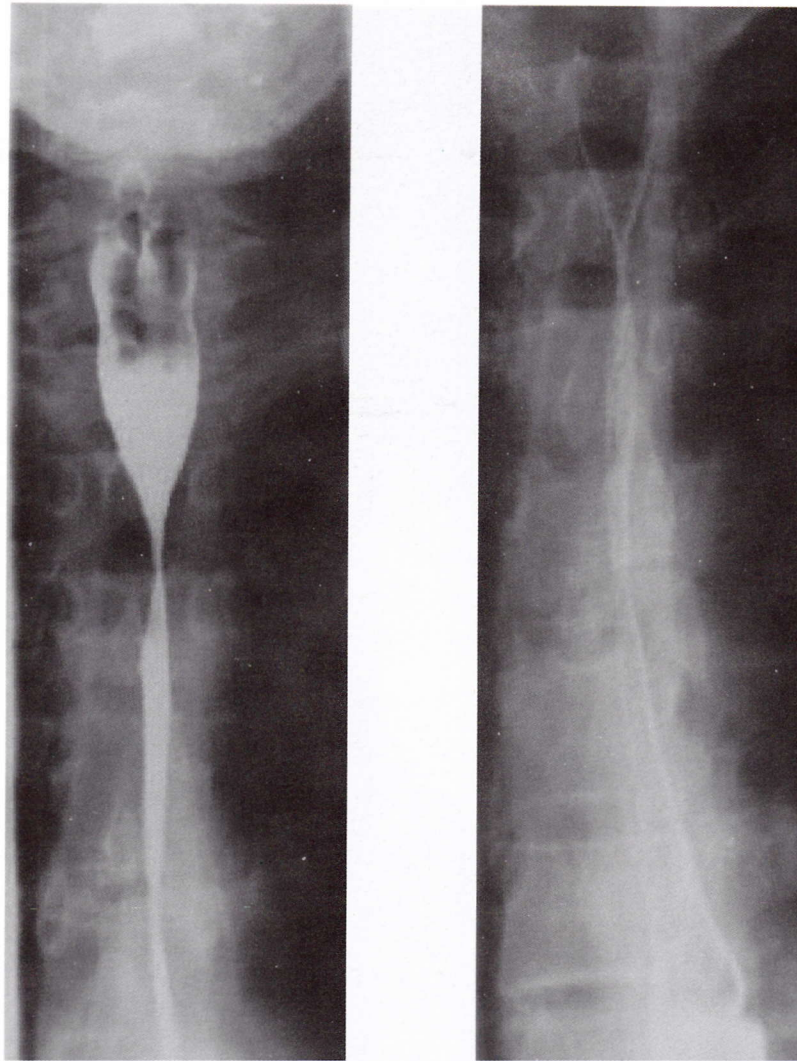
➡ Note:

- Irregular filling defect with shouldering & rat tail appearance usually in the middle third of esophagus (esophagus is interrupted above the diaphragm).

Questions

- | | |
|--|---|
| 1. Dysphagia is an early symptom in this disease. | F |
| 2. This patient has dysphagia to fluids more than solids. | F |
| 3. Barrett's esophagus is a predisposing factor. | T |
| 4. Endoscopy & biopsy is the investigation of choice. | T |
| 5. Esophageal intubation is the best palliative treatment. | F |

Corrosive Stricture



➡ Note:

- Narrowing in the middle third with smooth outline & mild proximal dilatation.

Questions

- | | |
|---|---|
| 1. The underlying cause is ingestion of a caustic material. | T |
| 2. Chest infection can be a possible complication. | T |
| 3. Chemical antidote is indicated. | F |
| 4. The main line of treatment is dilatation. | T |
| 5. Gastric pull up is the best line of treatment. | F |

Cardiac Achalasia



➔ **Note:**

- Smooth narrowing of the lower end of esophagus at or below diaphragm (Parrot beak), marked dilatation of esophagus & absence of gastric air bubble.

Questions

1. This patient has dysphagia to fluids more than solids.
2. This patient may present with abdominal distention.
3. Barrett's esophagus is a complication of this disease.
4. Manometric study is a useful investigation for this disease.
5. This condition is treated by cardiomyotomy.

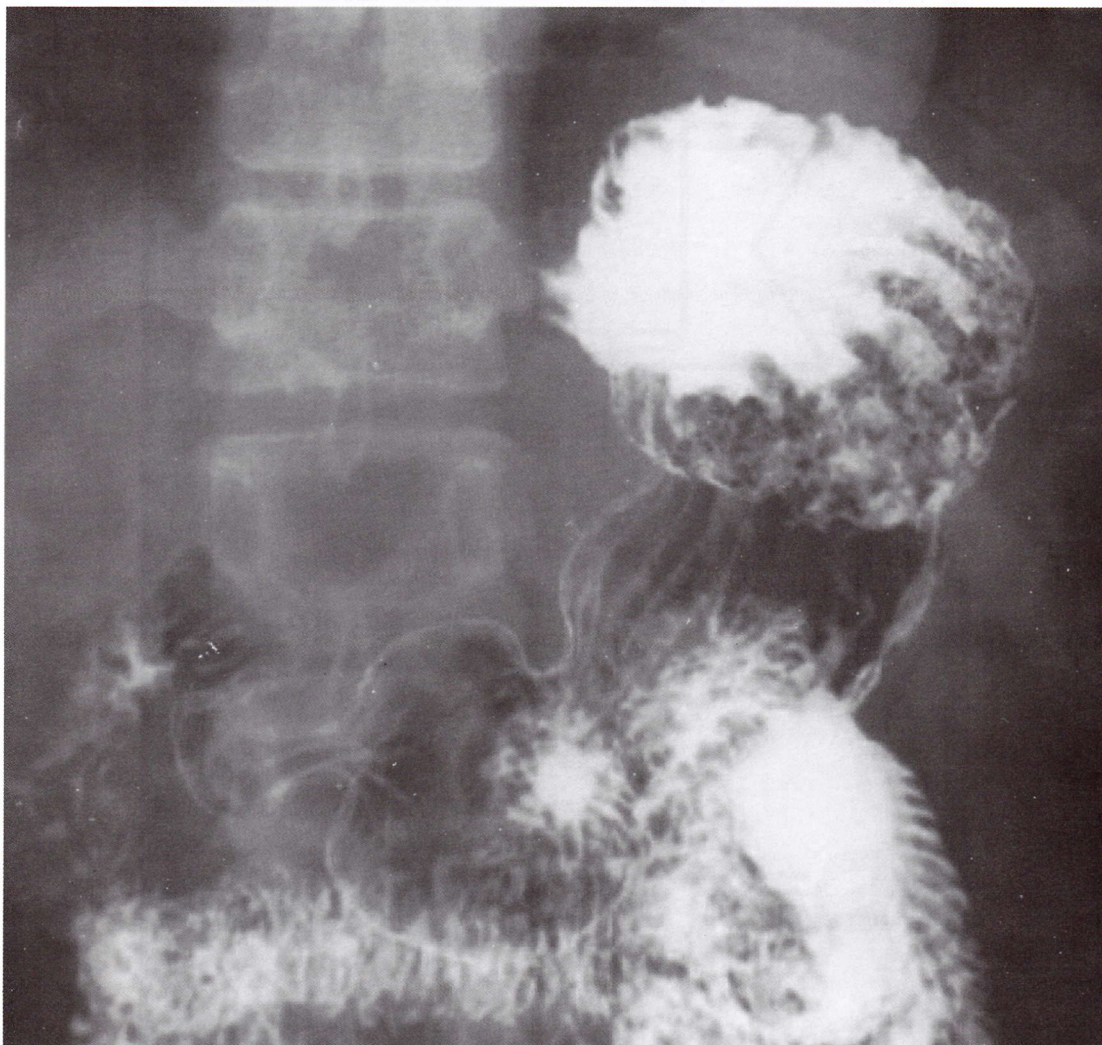
T
F
F
T
T

-3-

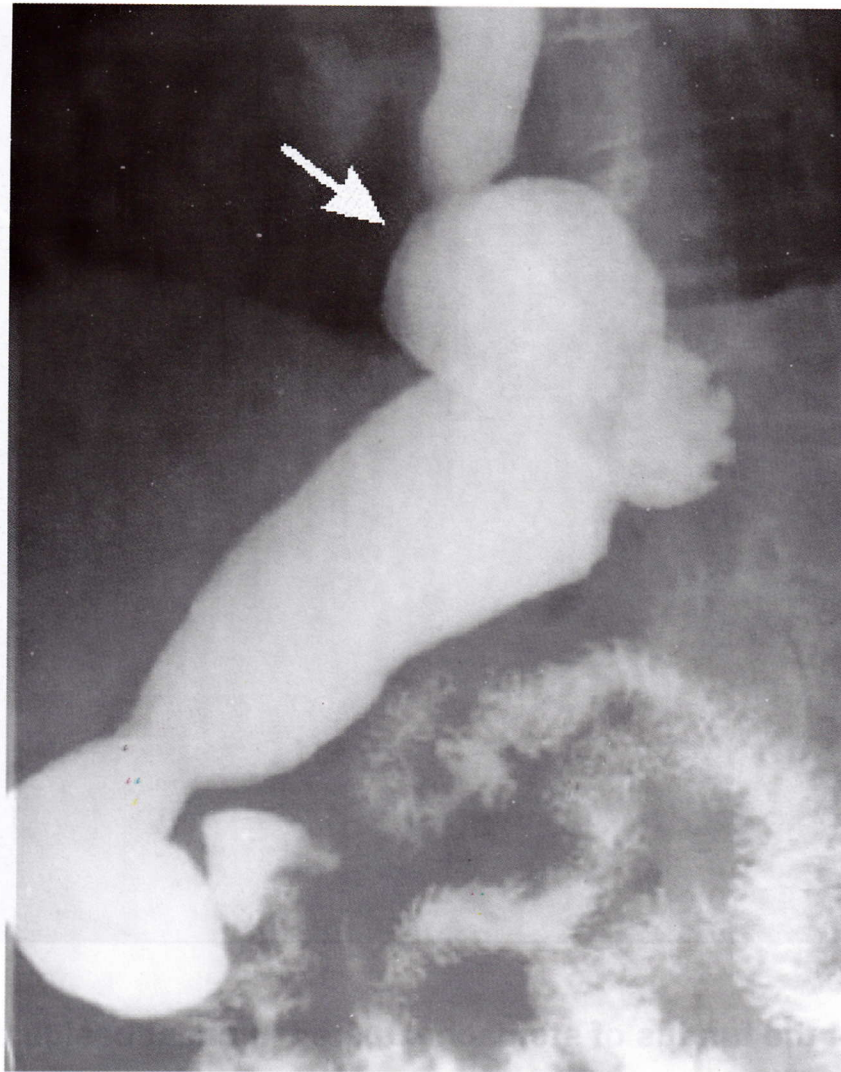
**Stomach
&
Duodenum
Radiology**

Normal Stomach & Duodenum

■ Barium swallow



Sliding Hiatus Hernia



➡ **Note:**

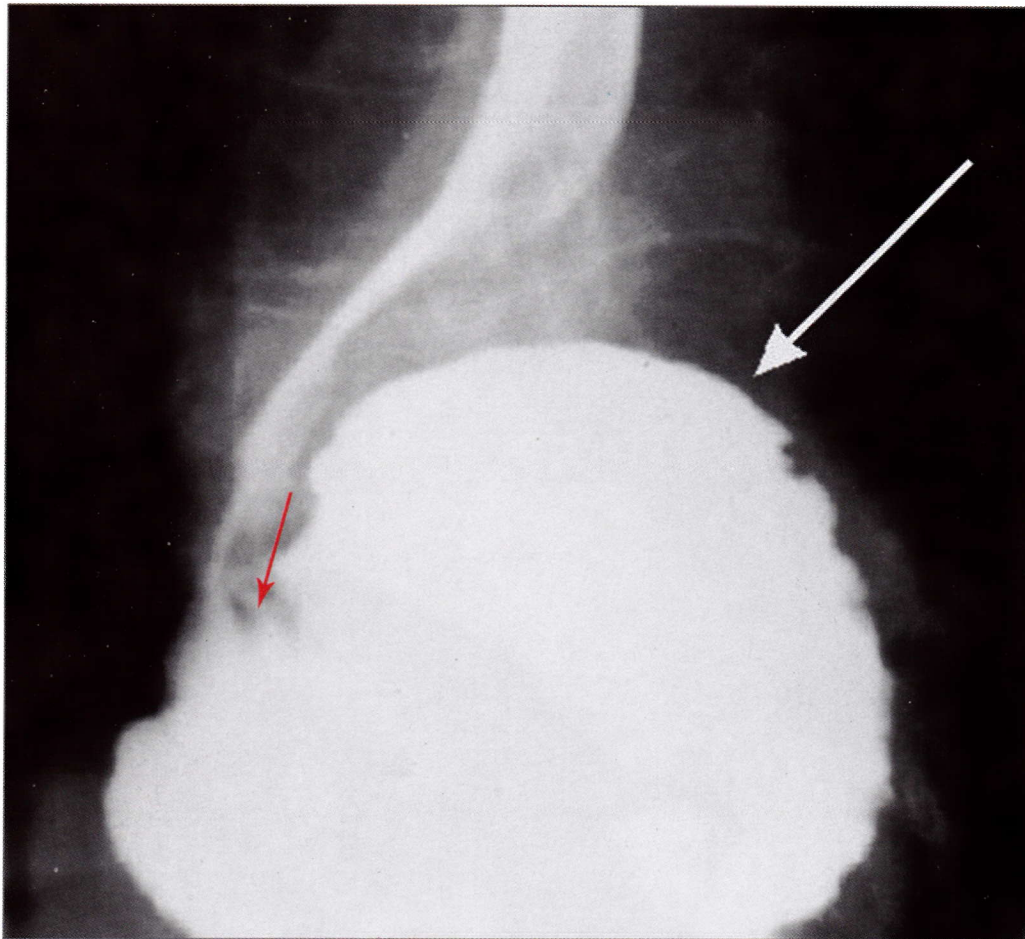
- **Esophago-gastric junction & fundus of stomach situated above the diaphragm.**

Questions

1. This study is done while the patient is in Trendelenburg position.
2. This patient may present by chest pain.
3. The cardia is seen above the diaphragm.
4. pH study is not of value in this patient.
5. Fundoplication is a line of treatment.

T
T
T
F
T

Para-Esophageal Hernia



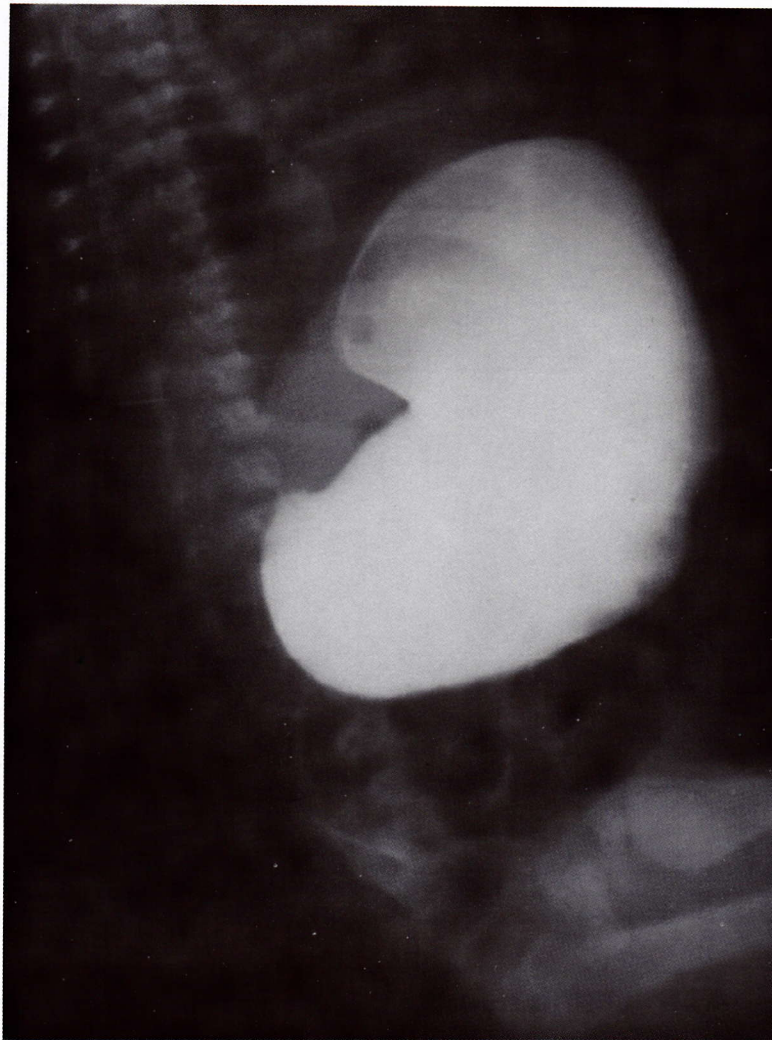
➡ **Note:**

- Part of the fundus of stomach situated in chest beside the normal esophagus.
- The angle between esophagus & stomach is preserved.

Questions

- | | |
|--|---|
| 1. This study is done while the patient is in Trendlenburg position. | T |
| 2. This patient may present by dyspnea following meals. | T |
| 3. The cardia is seen above the diaphragm. | F |
| 4. It is herniation of the greater curvature of stomach. | T |
| 5. Antacids are a line of treatment. | F |

Congenital Hypertrophic Pyloric Stenosis {CHPS}



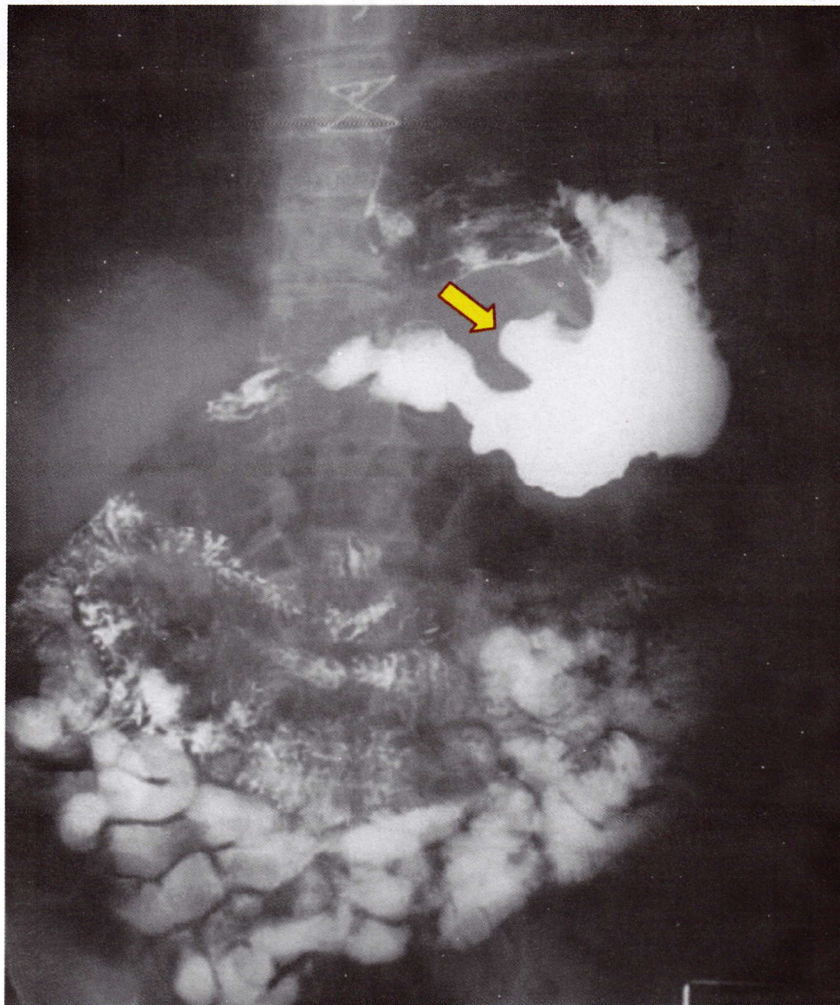
➡ **Note:**

■ **Distended stomach with narrowing of pyloric canal in a child.**

Questions

1. This study is gastrographin meal with lateral view image. **T**
2. The infant is presented by vomiting dating since birth. **F**
3. Physical examination of this patient reveals visible gastric waves & olive like pyloric mass in the epigastrium. **T**
4. U/S is the investigation of choice. **T**
5. Pyloromyotomy is the main line of treatment. **T**

Chronic Benign Gastric Ulcer



➡ Note:

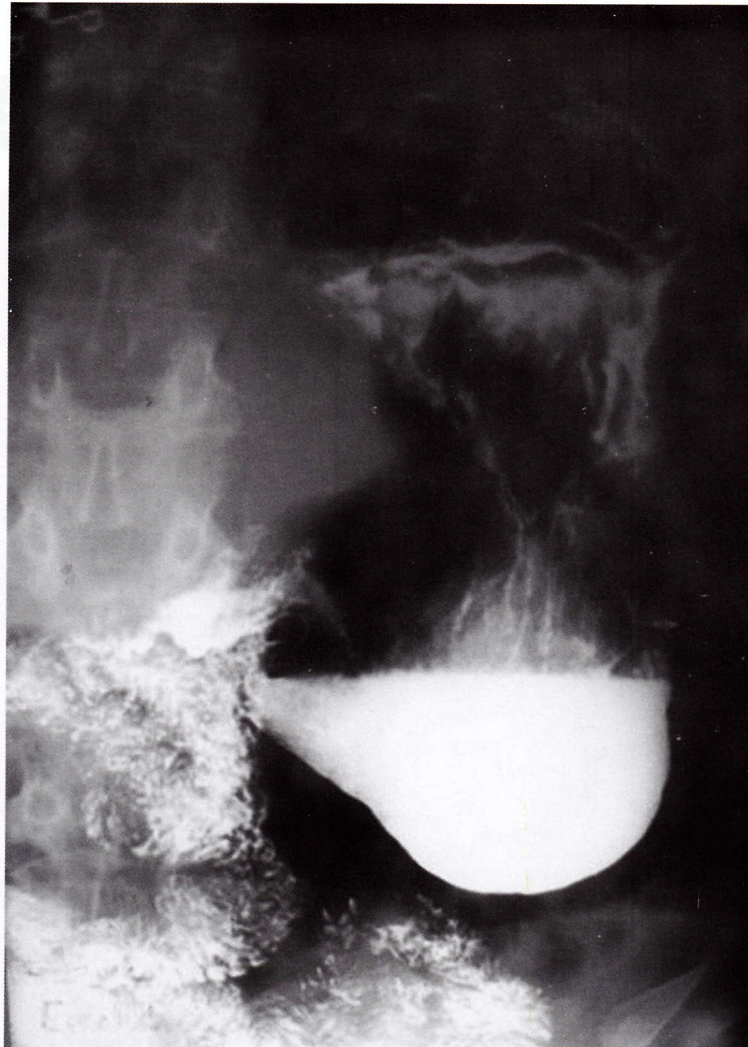
- Ulcer niche projecting usually on the lesser curvature & a notch in the opposite side on the greater curvature.
- After emptying, a barium flake is seen in the ulcer niche & mucosal folds are seen radiating from it.

Questions

1. Helicobacter infection is the main cause of this condition. T
2. Periodic exacerbation of symptoms is a common feature of this disease. F
3. Multiple biopsies are mandatory on endoscopy to exclude malignancy. T
4. Hematemesis is a possible complication of this condition. T
5. Vagotomy & drainage is the main line of treatment. F

Pyloric Stenosis

■ Barium meal



➡ **Note:**

- Stomach is dilated reaching down to the pelvis with soup dish appearance.
- Minimal contrast material pass through pylorus to intestine.

Questions

- | | |
|---|---|
| 1. The underlying cause is fibrosed duodenal ulcer. | T |
| 2. This patient may present by carpo-pedal spasm. | T |
| 3. This patient may present by pulsatile epigastric swelling. | F |
| 4. This condition may lead to metabolic alkalosis. | T |
| 5. Vagotomy & gastro-jejunostomy is the main line of treatment. | T |

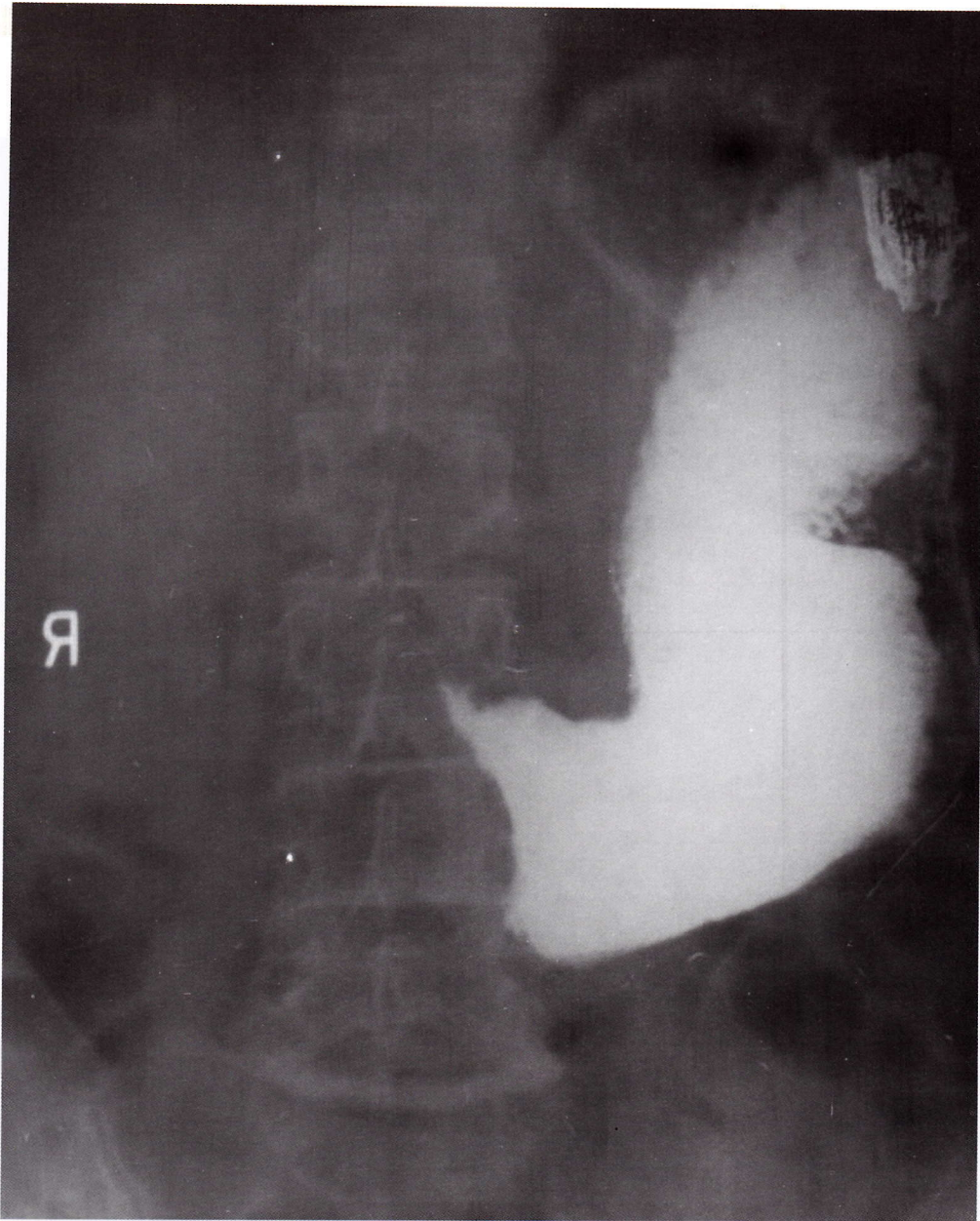
Cancer Stomach

■ It may present as:

Irregular Filling Defect

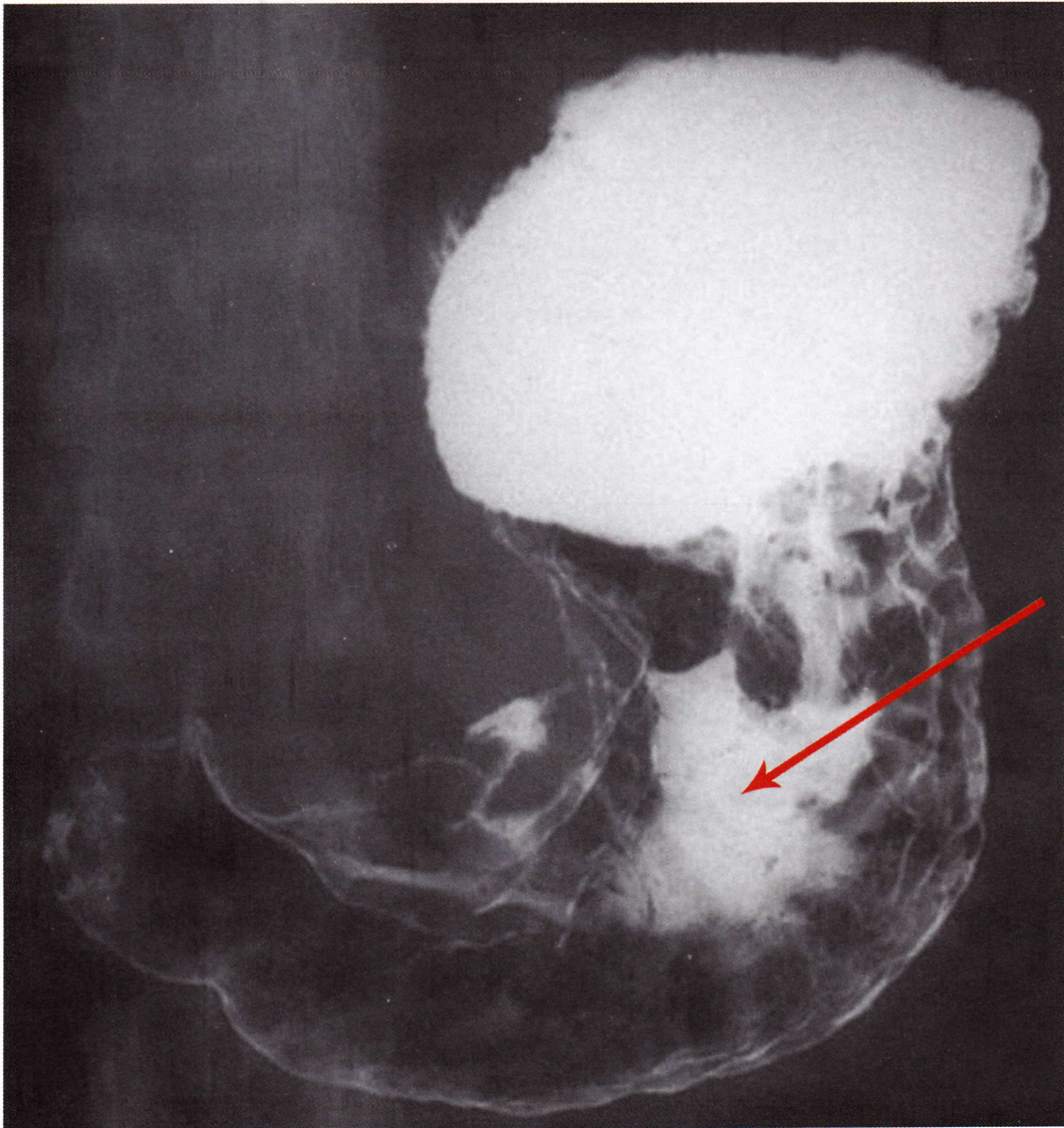


■ Mass causing irregular filling defect in the antrum & body



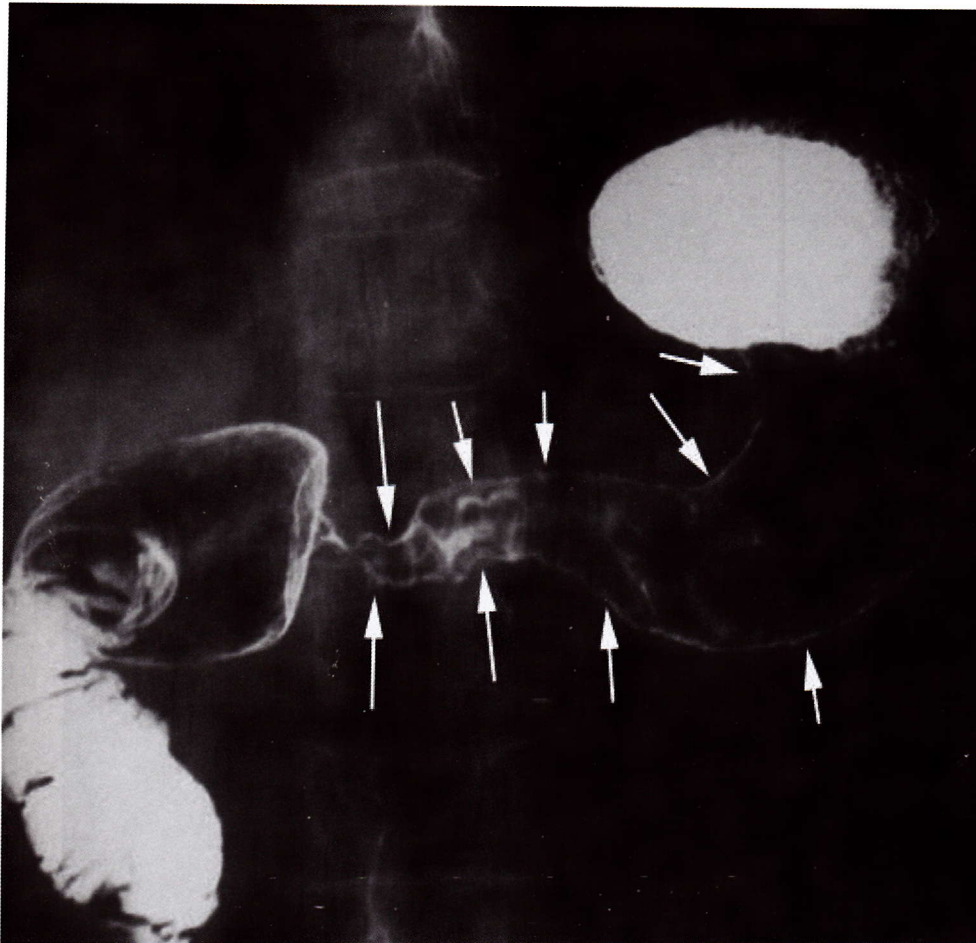
- In the pylorus which may cause irregular contours on both lesser & greater curvatures.

Malignant Ulcer Niche



- Ulcer causing malignant ulcer niche anywhere in stomach particularly in the antrum or greater curvature, on top of a mass (not projecting beyond stomach margin), without mucosal folds radiating from the ulcer & without notch.

Linitis Plastica



► **Notes:**

- **Marked narrowing of the lumen of stomach without interruption of the flow of barium.**

Questions

1. The patient in early stages complains of non-specific symptoms. **T**
2. The patient may present with symptoms of pyloric obstruction. **T**
3. Endoscopy & biopsy is the investigation of choice. **T**
4. Subtotal radical gastrectomy is the main line of treatment in early cases. **T**
5. Gastro-jejunostomy is a line of treatment in complicated cases. **T**

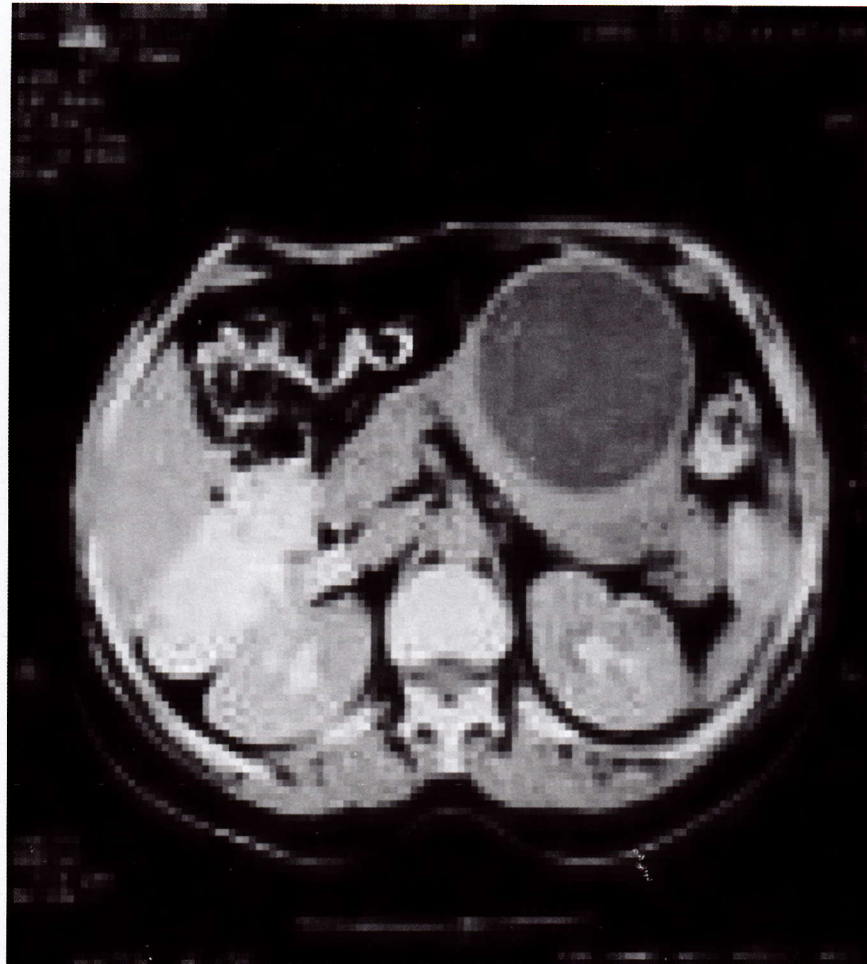
Pseudo-Pancreatic Cyst

■ X-ray, barium meal.



■ Seen as displacement & compression of the stomach &

■ CT scan



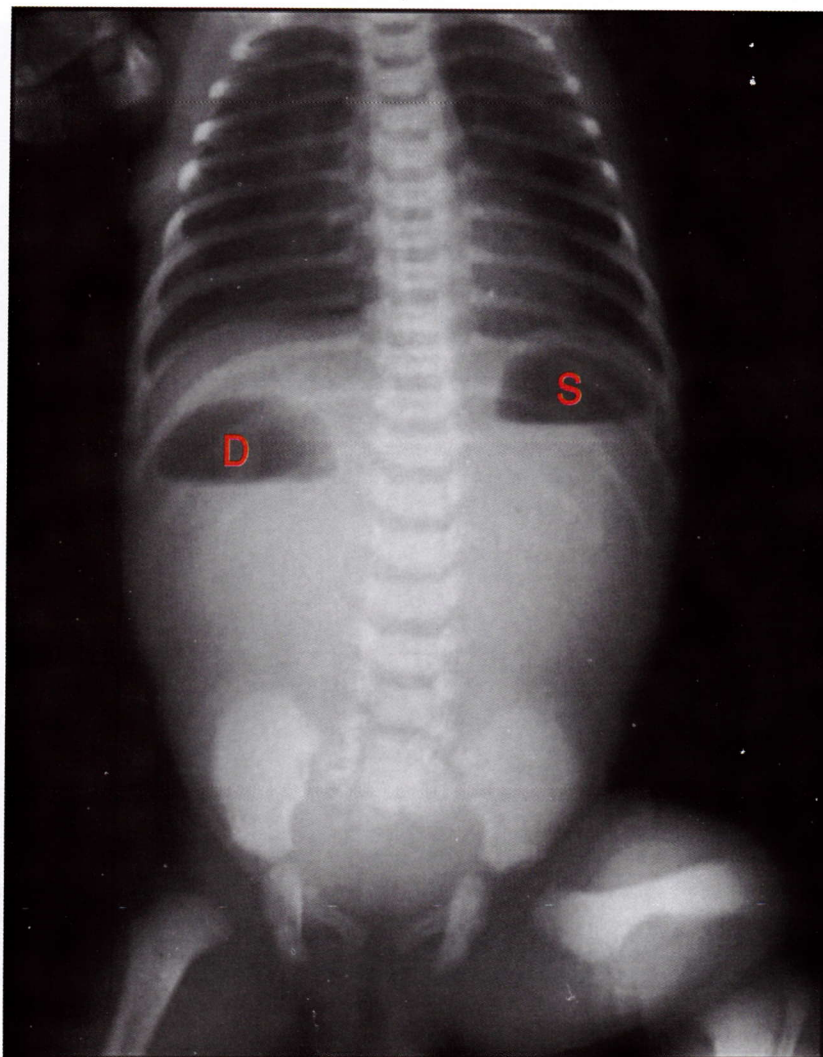
■ Seen as a cyst in the tail of pancreas.

Questions

1. This is a cyst related to pancreas.
2. Infection & abscess formation is a possible complication.
3. Abdominal aortic aneurysm is differential diagnosis.
4. Conservative treatment is a line of treatment in early cases.
5. Cysto-gastrostomy is the treatment of choice.

T
T
T
T
T

Duodenal Atresia



➡ **Note:**

- Dilated stomach (S).
- The part of duodenum (D) above the obstruction contain gas bubbles (double bubble sign).

Questions

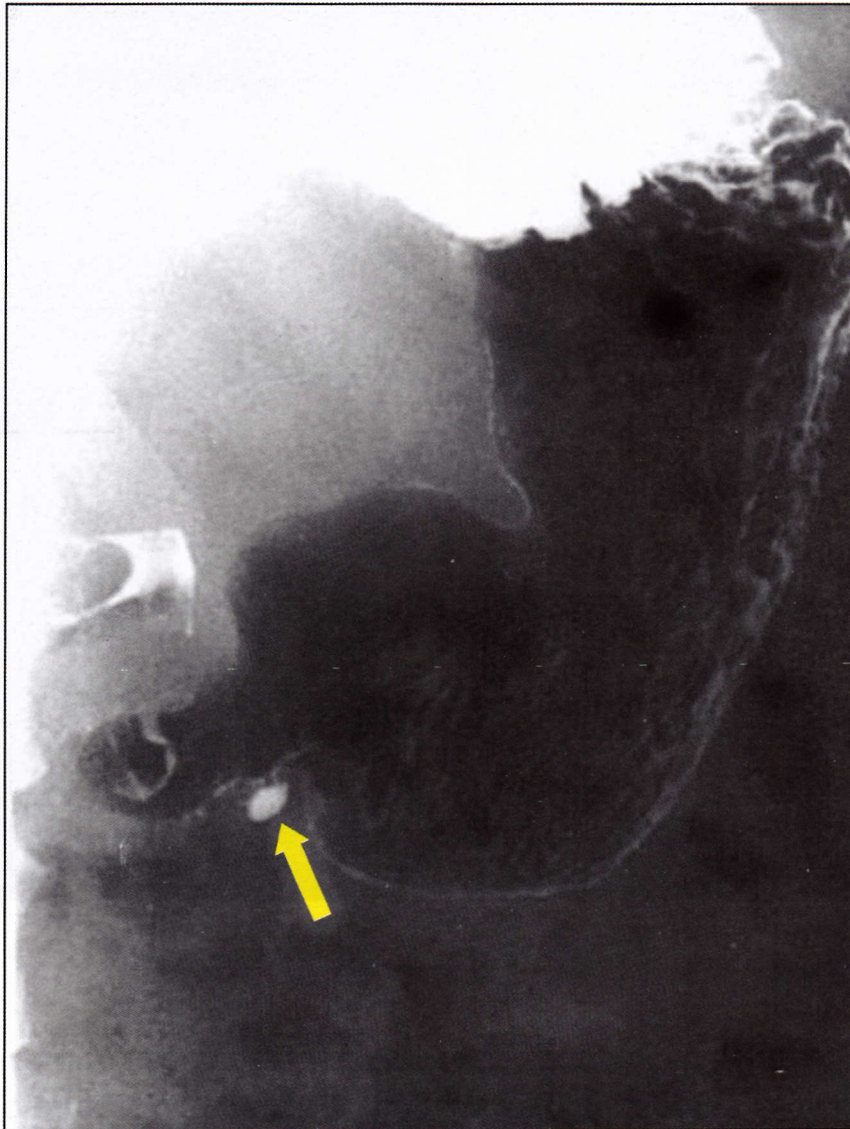
1. This study is x-ray imaging in erect position.
2. The neonate presents by picture of intestinal obstruction.
3. Annular pancreas may be a possible cause.

T
T
T

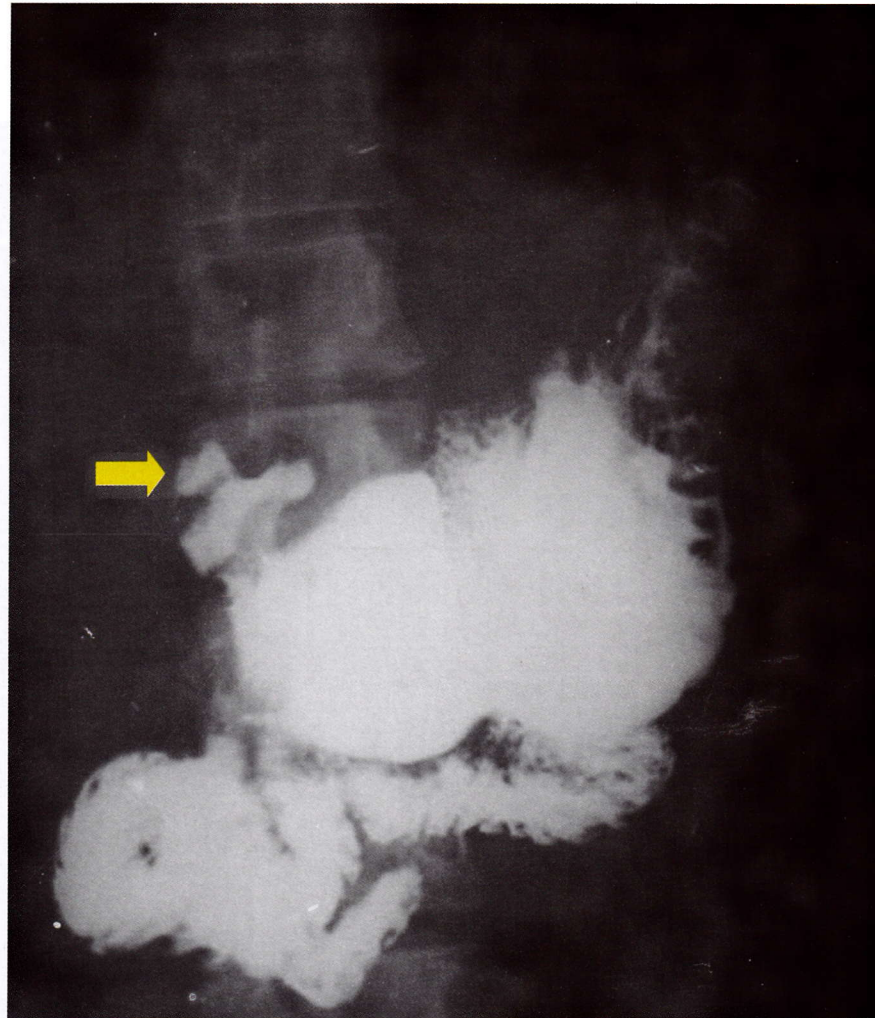
Chronic Duodenal Ulcer

■ It may be seen as

Ulcer Niche Full Of Barium



Persistent Deformity In The Duodenal Cap (Trifoliate Deformity)



Questions

1. The underlying cause may be Zollinger Ellison syndrome. T
2. Periodic exacerbation of symptoms is a common feature of this condition. T
3. Endoscopy & biopsy are mandatory to exclude malignancy. F
4. Endoscopy is more accurate in diagnosis of this condition. T
5. Medical treatment is the treatment of choice in uncomplicated cases. T

Congenital Diaphragmatic Hernia



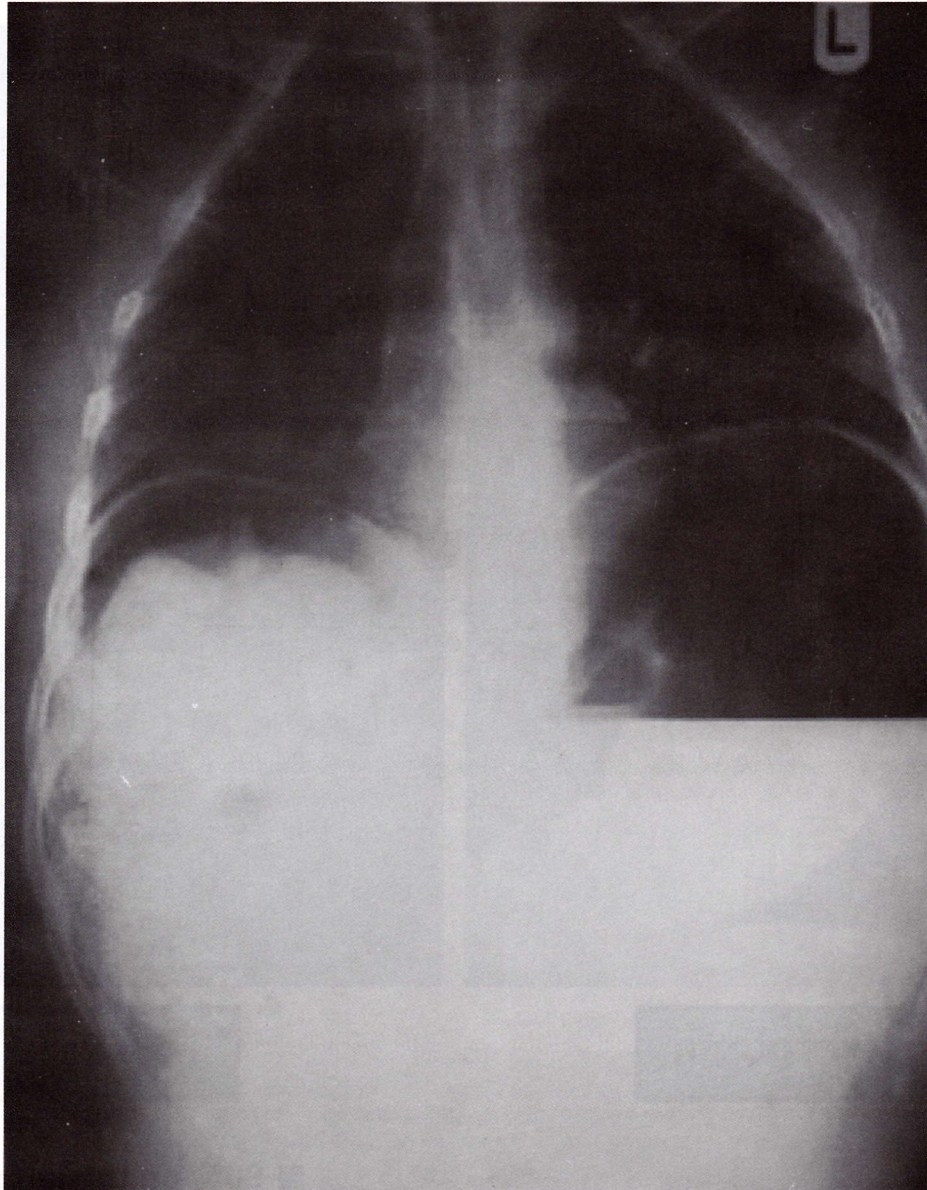
Morgagni



Bochdalek

■ 90% on the left side

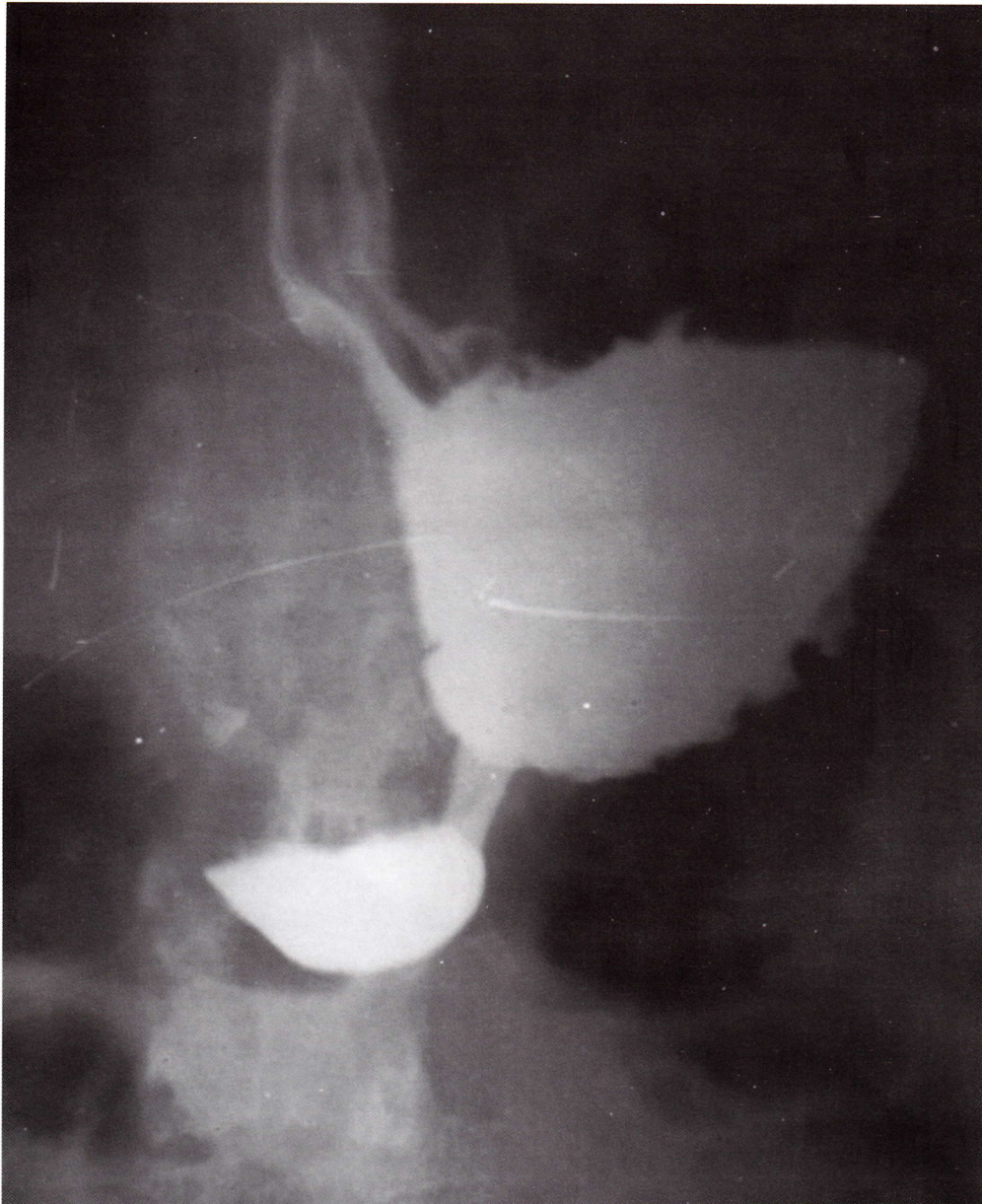
Perforated Ulcer



➡ **Note:**

■ Air under diaphragm

Hourglass Contraction Of Stomach



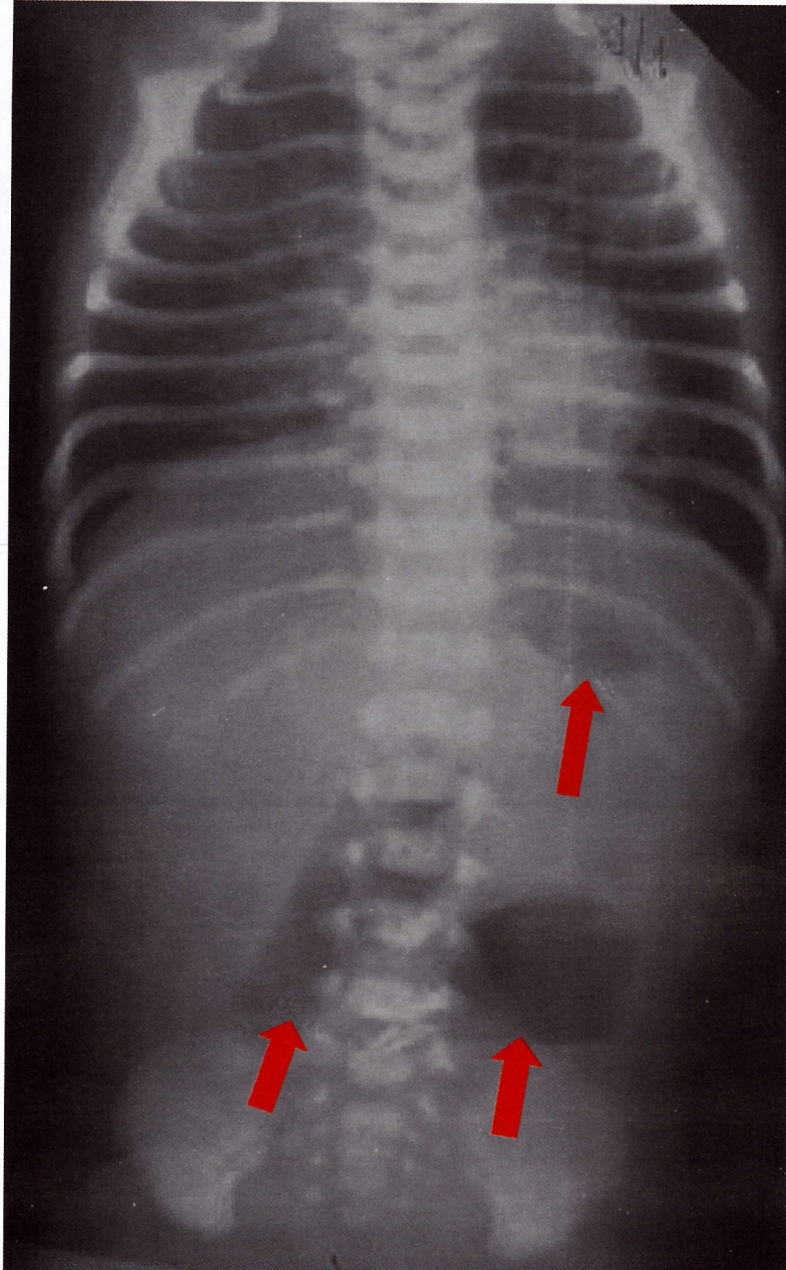
Volvulus Of Stomach

■ Barium meal

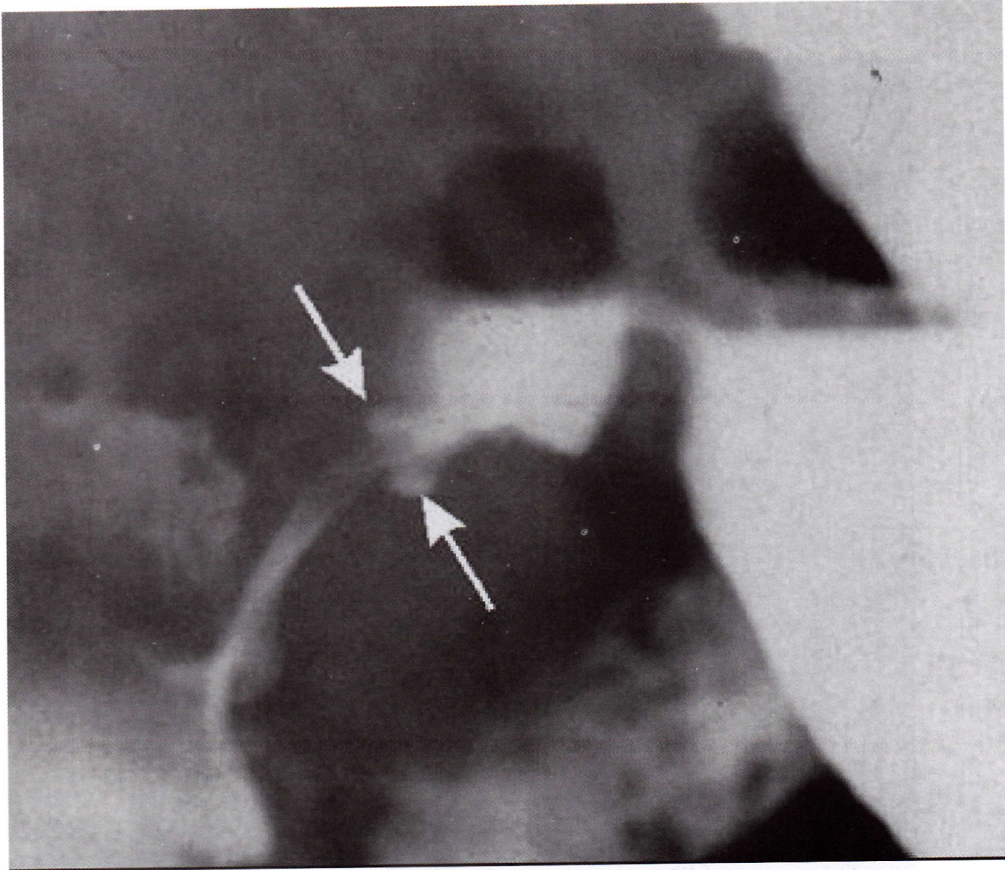


Jejunal Atresia

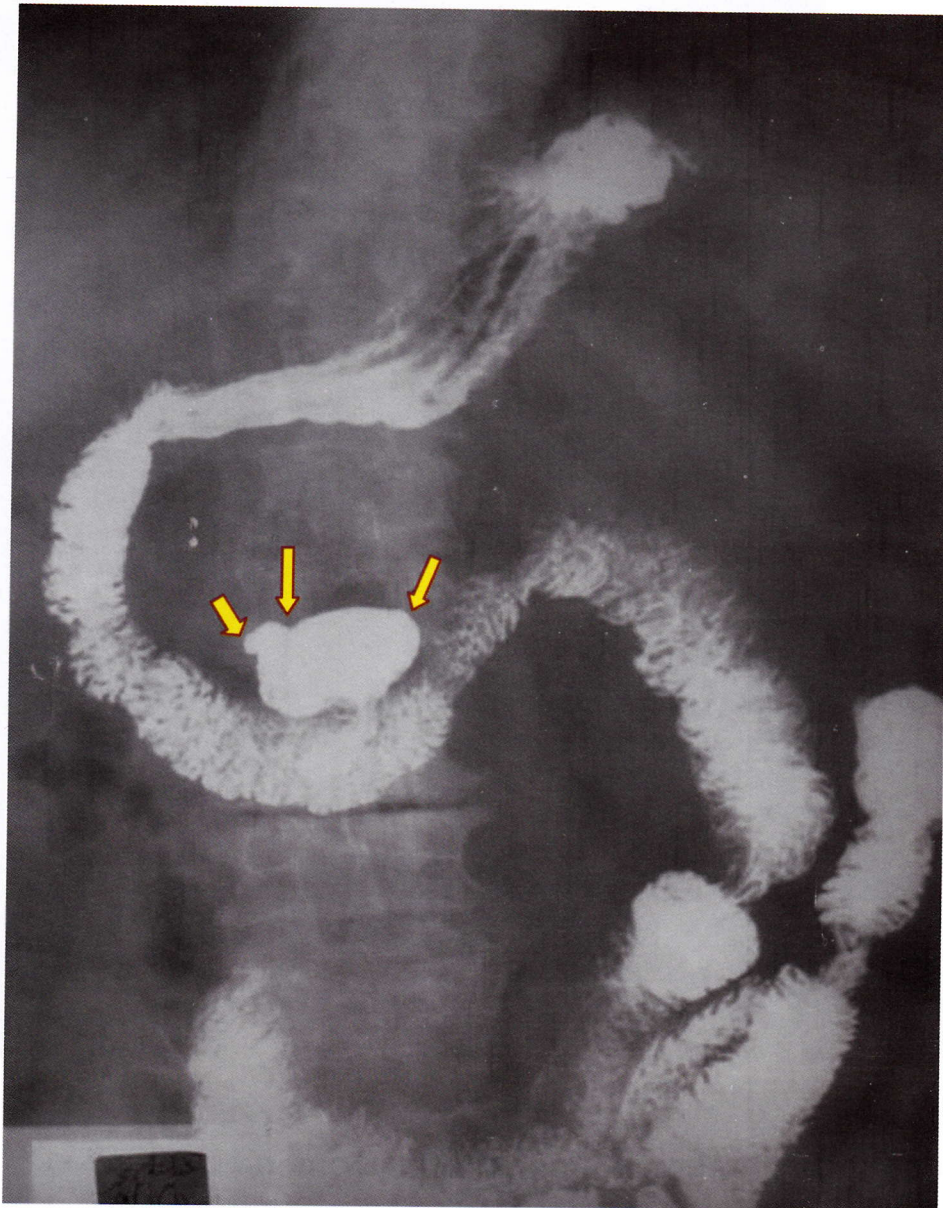
■ Triple gas bubbles.



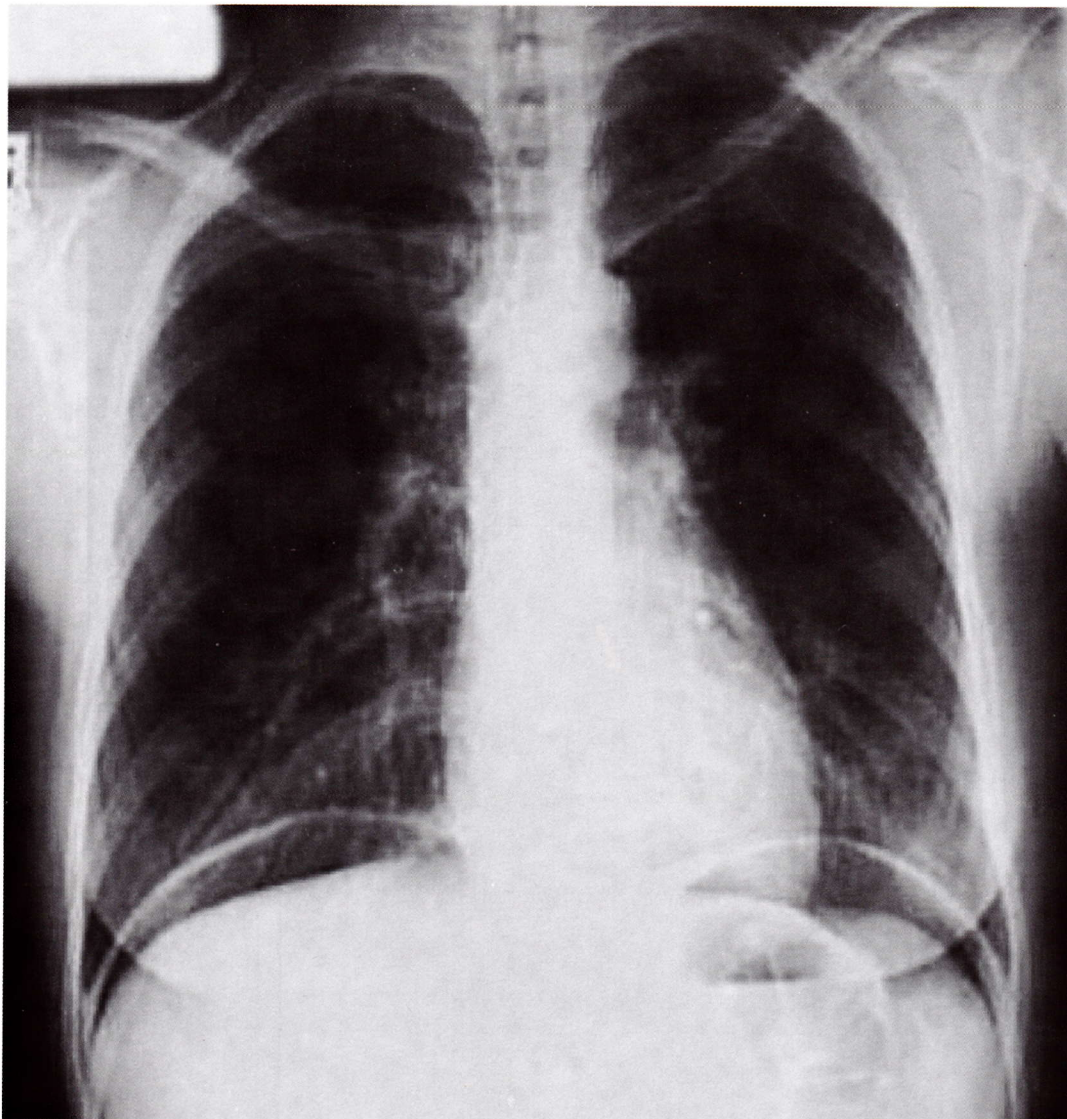
2 Duodenal Kissing Ulcers



Diverticulum Of Duodenum



Perforated Duodenal Ulcer



► **Note:**

■ Air under diaphragm in erect x-ray abdomen.

Questions

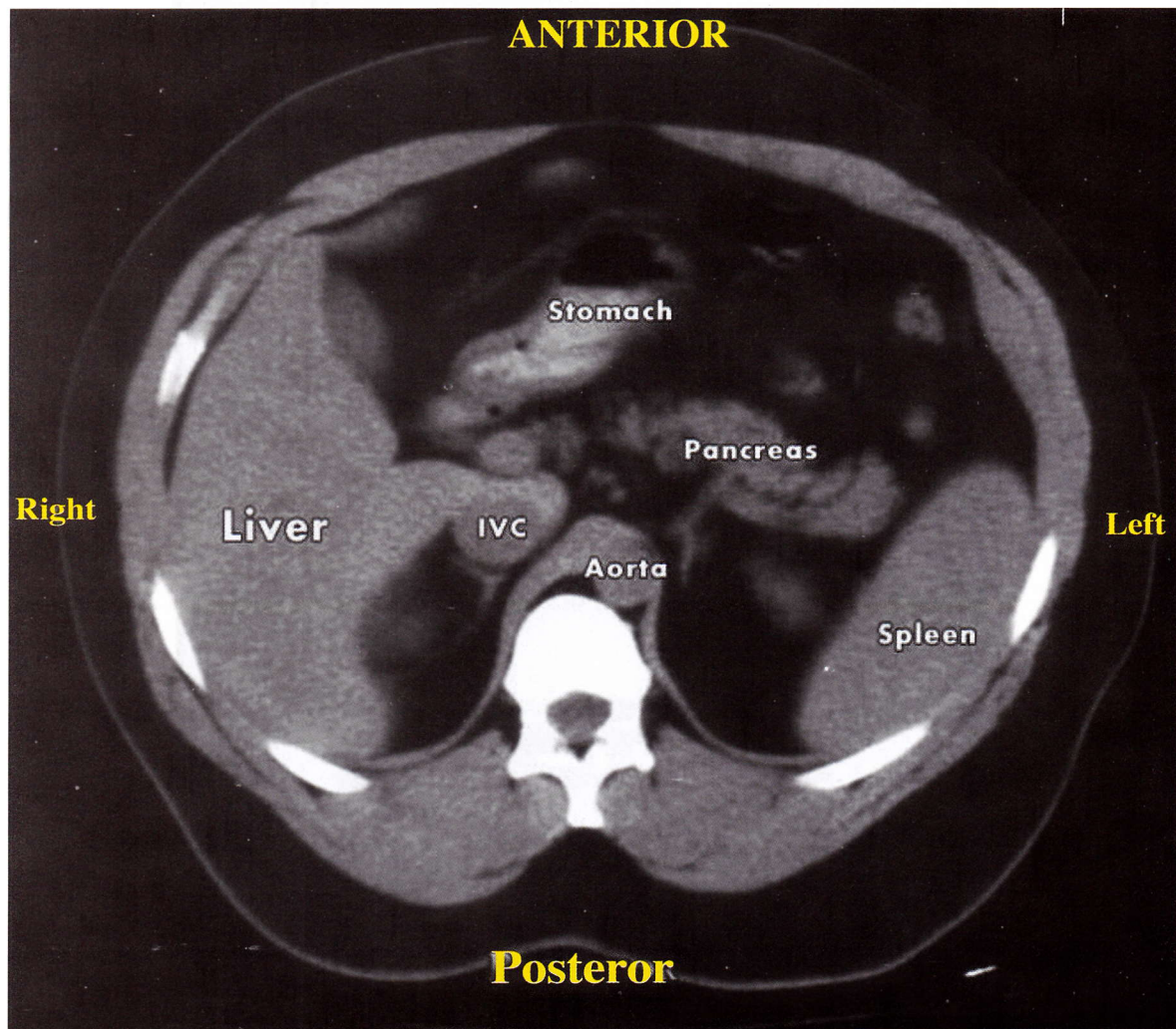
1. Perforation of duodenal ulcer causes this radiologic finding in 60% of cases. T
2. Perforated duodenal ulcer is the commonest cause of this radiologic finding. T
3. This radiologic finding may be seen after laparoscopy. T
4. This patient is presented clinically with peritonitis. T

-4-

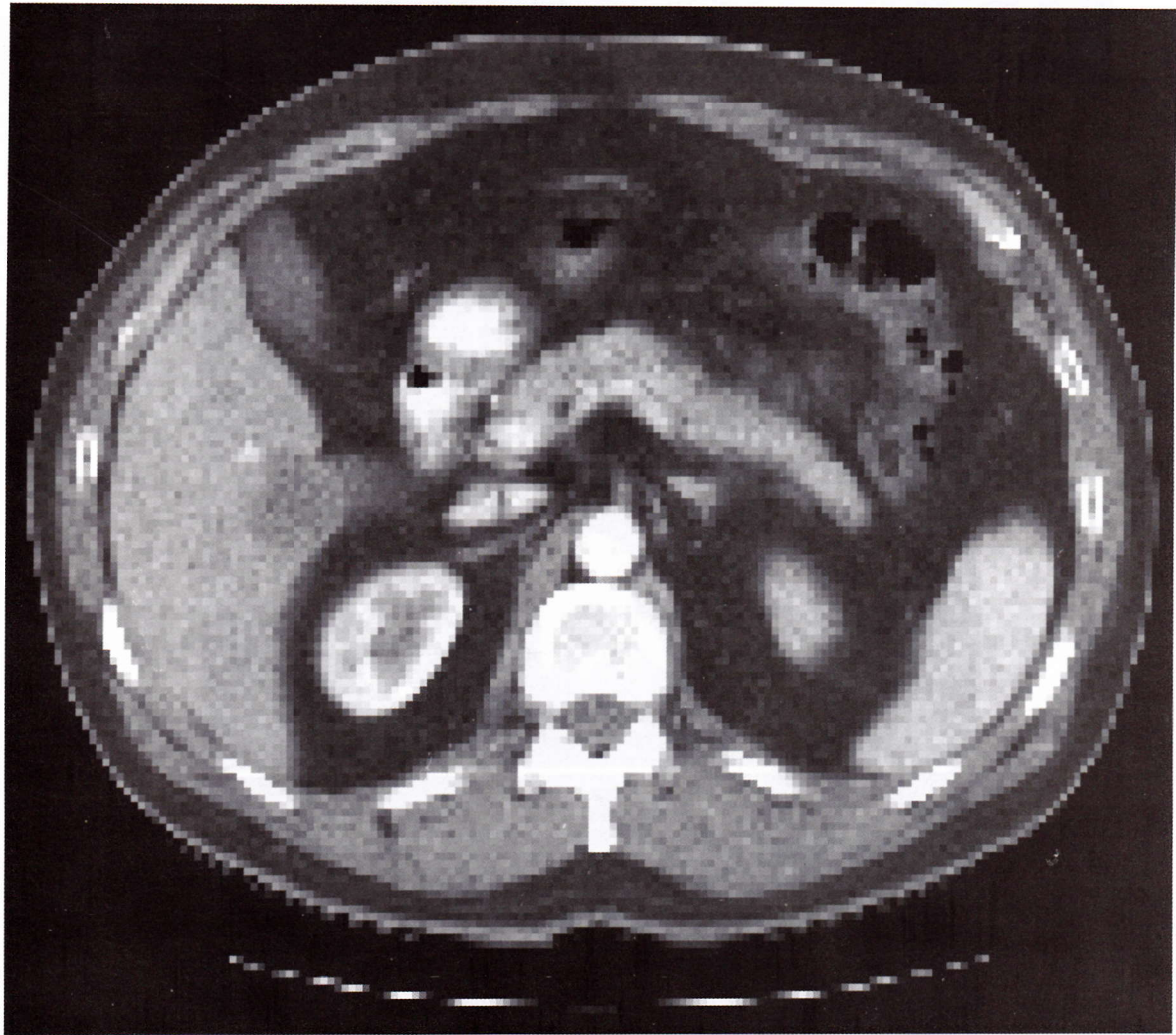
**Hepato -
Biliary
Radiology**

Liver

Normal CT Abdomen

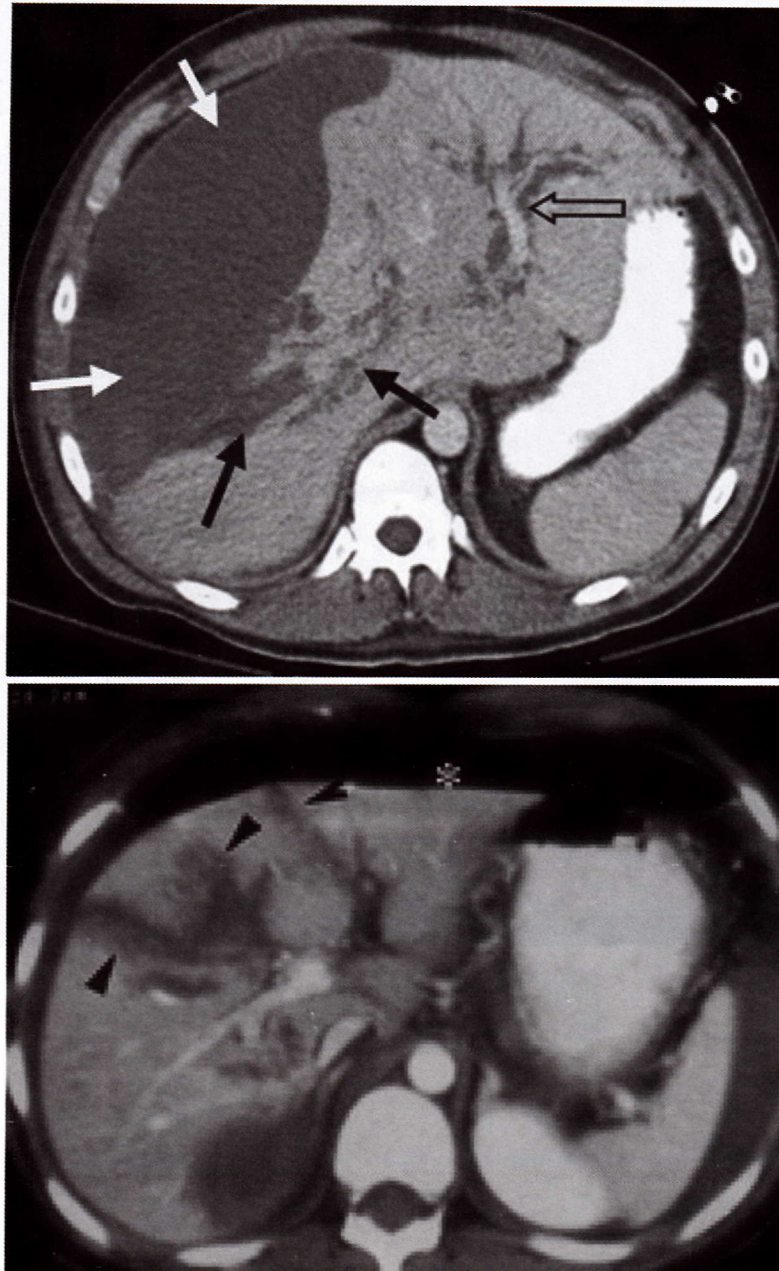


Without contrast



With IV contrast

Liver Injury (Rupture Liver)

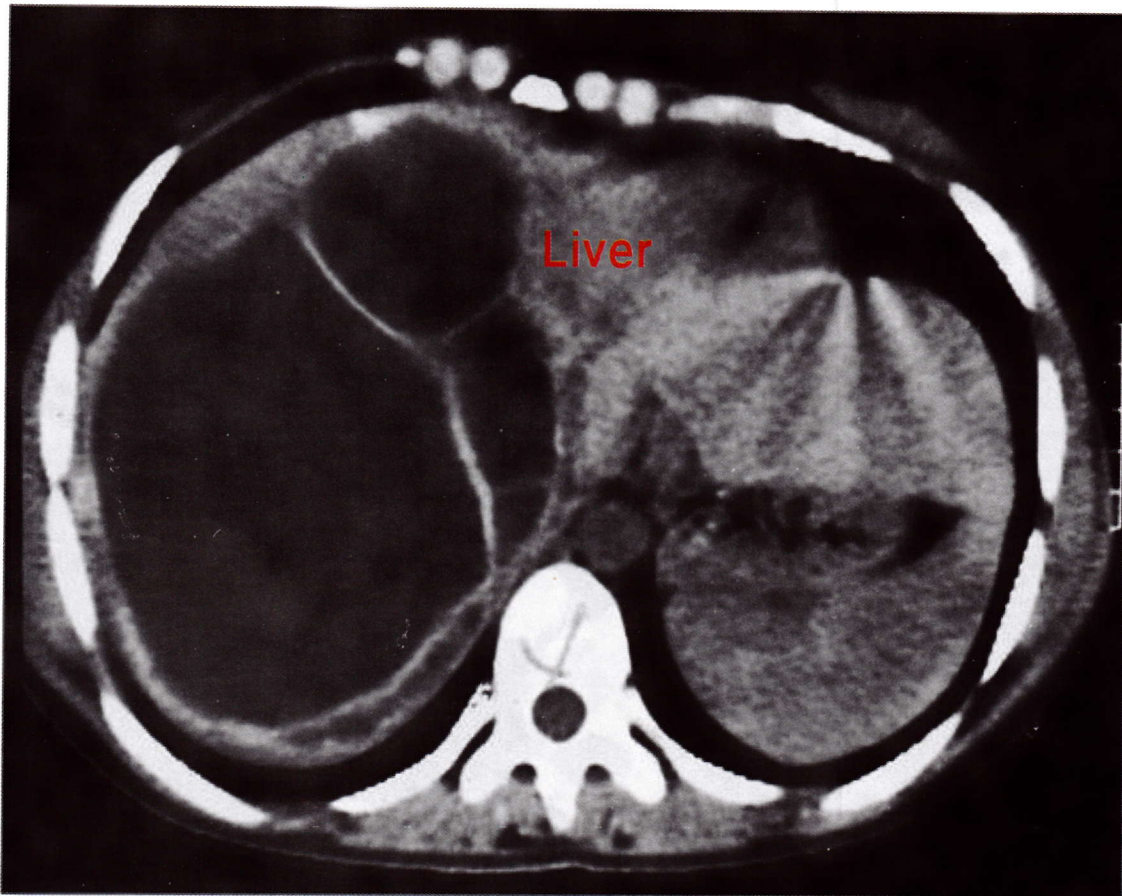


■ Seen as laceration in the liver with free intraperitoneal fluid adjacent to liver (peri-hepatic hematoma).

Questions

1. Liver is the commonest organ to be injured in blunt trauma. **F**
2. Evidence of ongoing blood loss & generalized peritonitis necessitate surgical exploration. **T**

Hydatid cyst

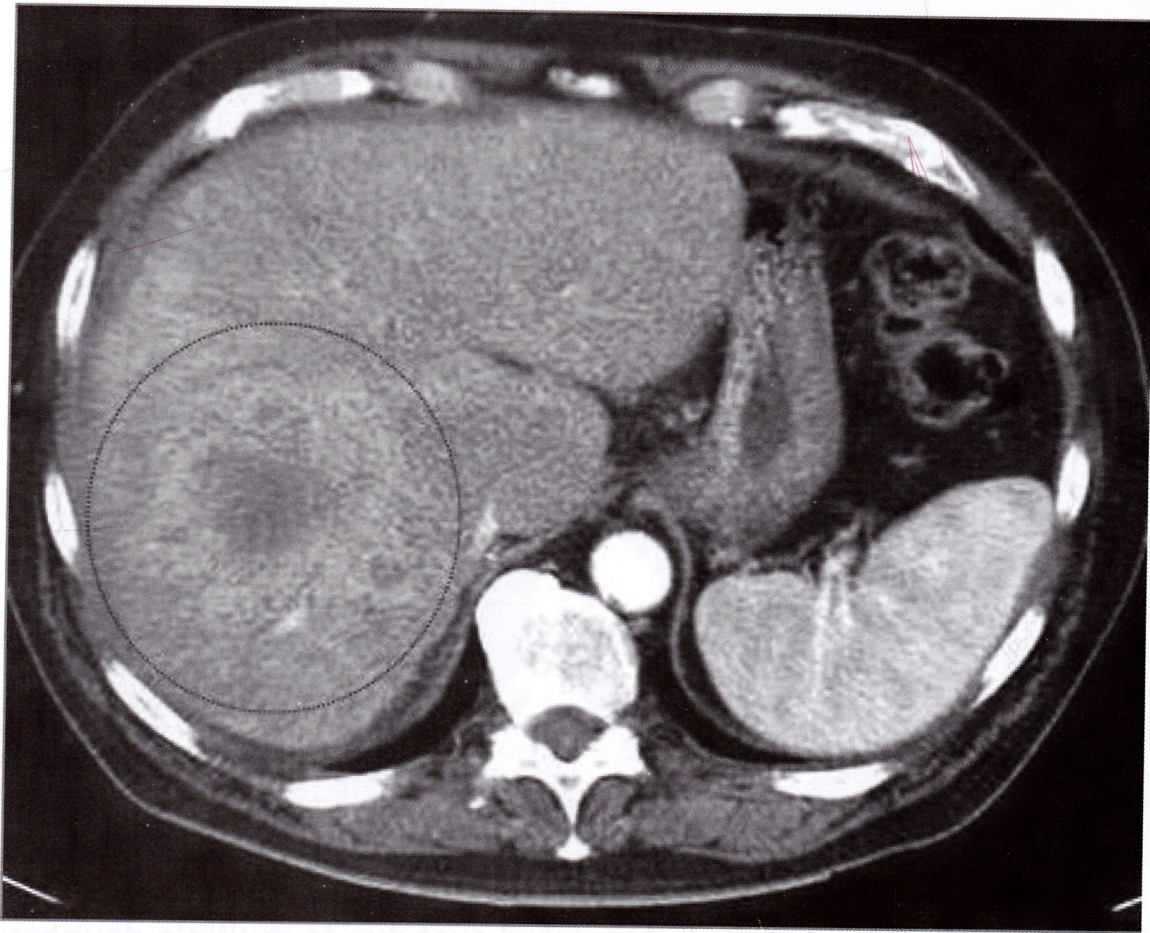


- Seen as well defined multi-loculated cyst due to multiple daughter cysts.

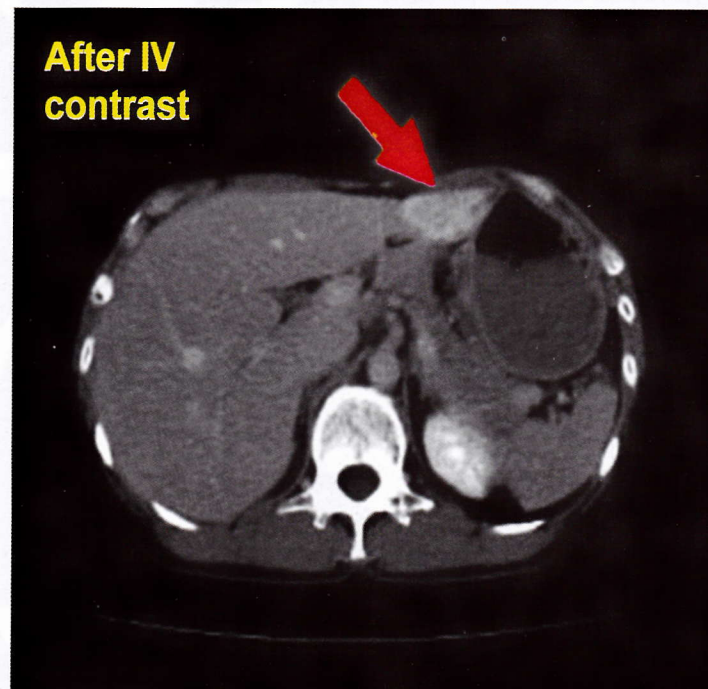
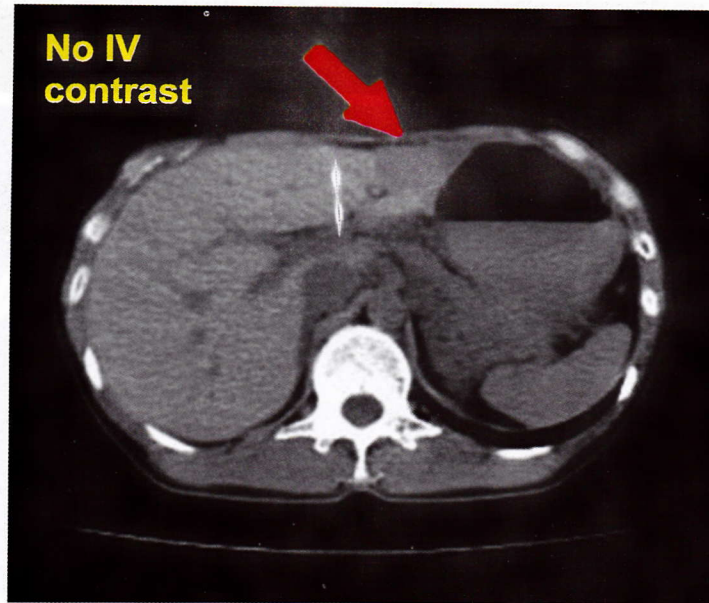
Questions

1. This condition occurs due to echinococcus granulosus infection of the liver. T
2. Most common liver cyst is hydatid cyst. T
3. Similar cysts may be seen in the spleen. T
4. Rupture of this cyst may lead to anaphylaxis. T
5. Medical treatment is the first line of treatment. T

Hepato-cellular Carcinoma



- Seen as irregular mass with heterogenous density & areas of central breakdown.



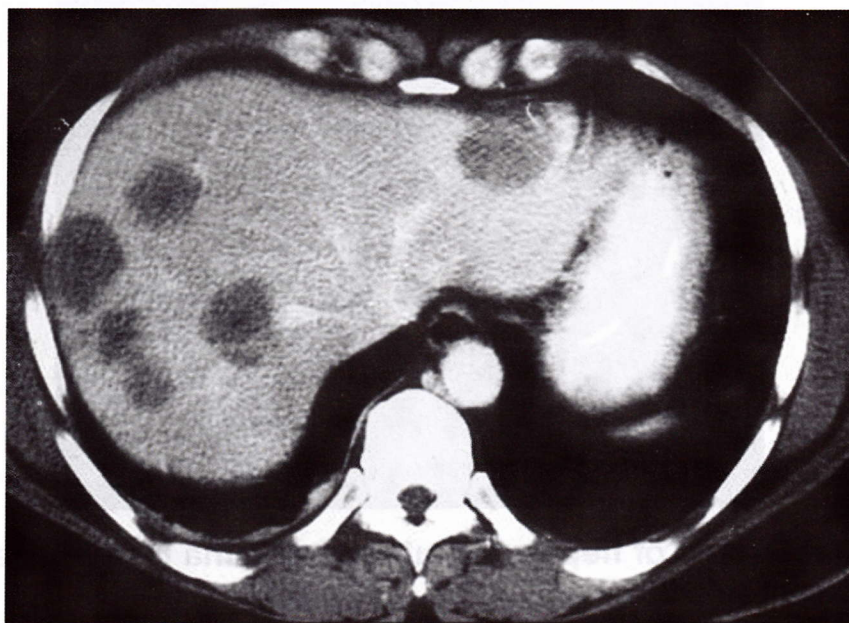
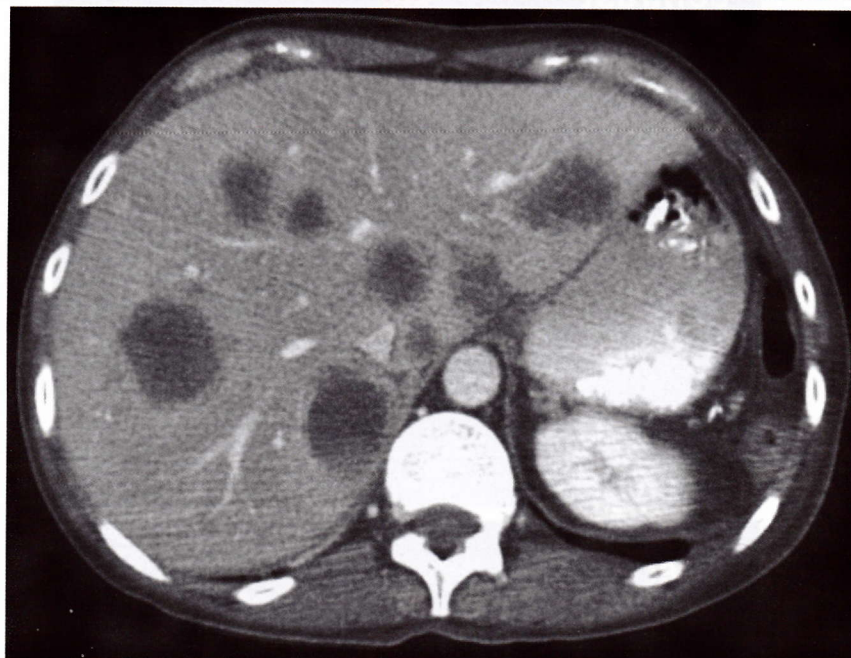
➡ **Note:**

- A characteristic of hepato-cellular carcinoma is enhancement after IV contrast injection.

Questions

- | | |
|--|----------|
| 1. Hepato-cellular carcinoma is the commonest primary liver tumour. | T |
| 2. Liver cirrhosis is the commonest etiological factor for this condition. | T |
| 3. Food contamination with aflatoxin can lead to this condition. | T |
| 4. Serum alpha-fetoprotein can help in diagnosis. | T |
| 5. Surgical treatment is the only line for treatment of this condition. | F |

Liver Metastasis



■ Seen as multiple masses with low density and different sizes.

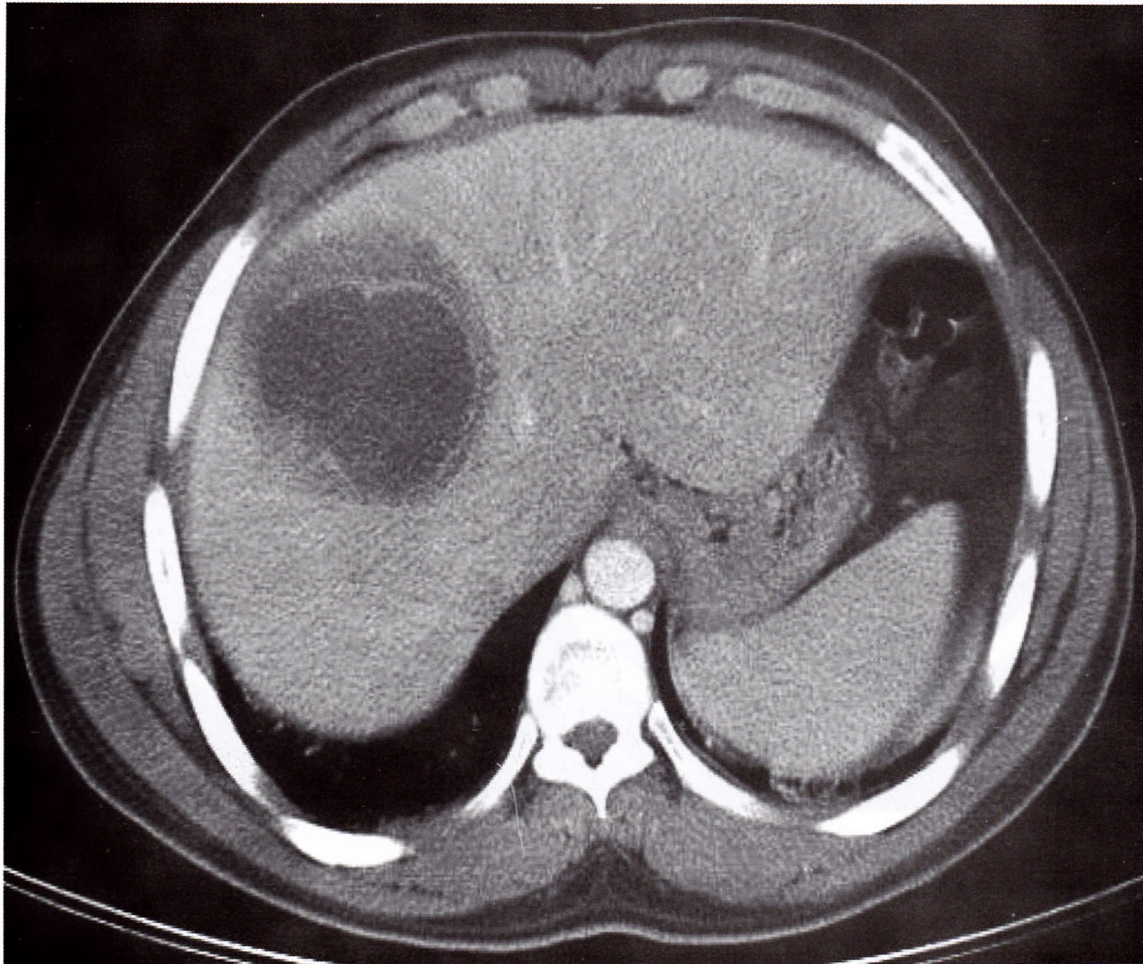
Questions

1. Primary is mostly from GIT or pancreas.
2. Metastasis is the most common malignant liver tumor.
3. The main line of treatment is chemotherapy.

T
T
T

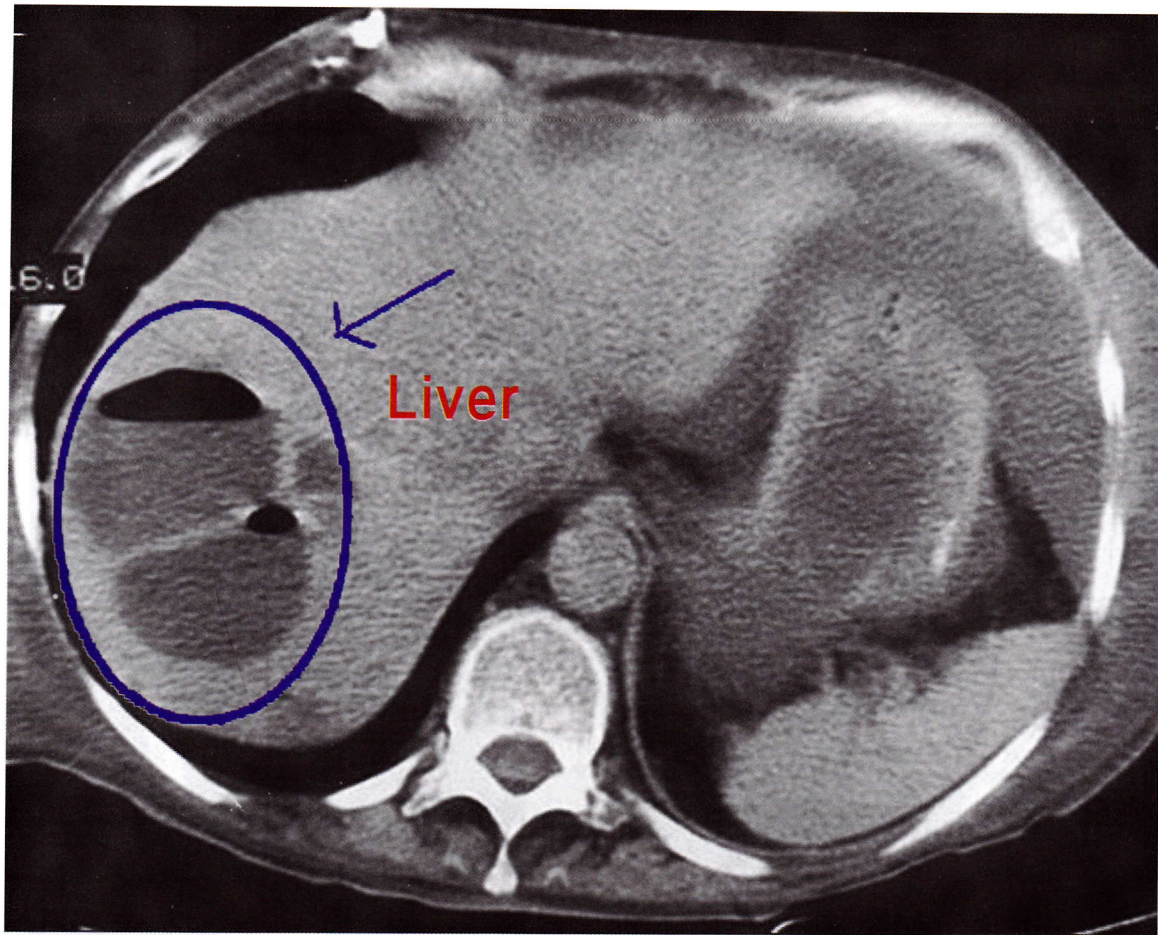
Liver Abscess

Amoebic liver abscess



- Seen as lesion with low density surrounded by region of increased density, but the higher density region may not be seen.

Pyogenic Liver Abscess



- Seen as multi-loculated cystic mass & air-fluid level may be present.

Questions

1. CT findings are enough to diagnose liver abscess without need to clinical picture and laboratory results. F
2. Amoebic liver abscess causes hectic fever. F
3. Diagnosis of pyogenic liver abscess should be confirmed by guided aspiration. T

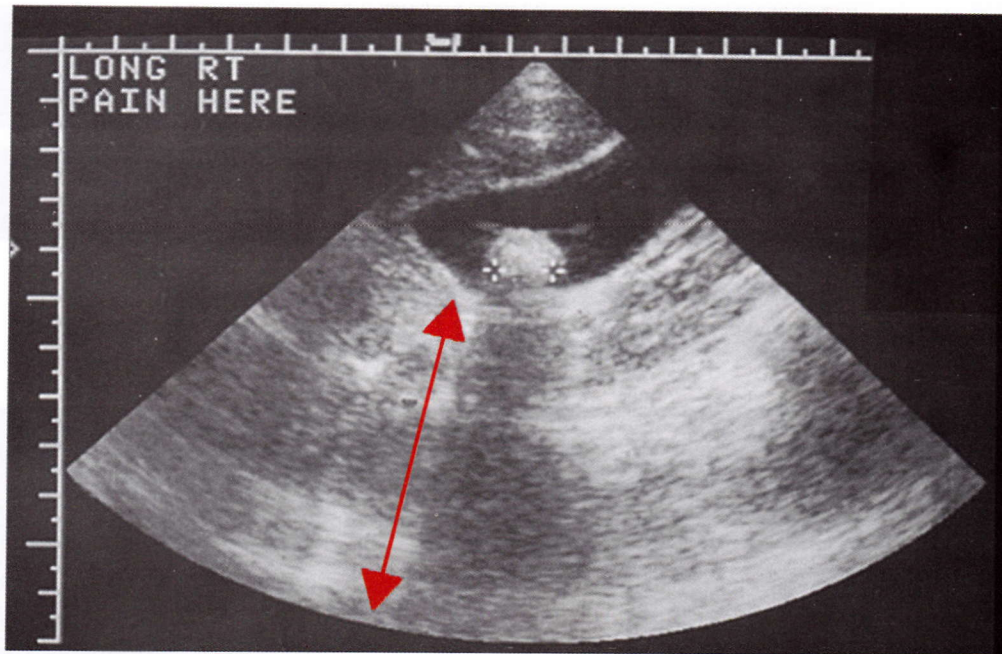
Gall bladder

Gall Bladder Stones

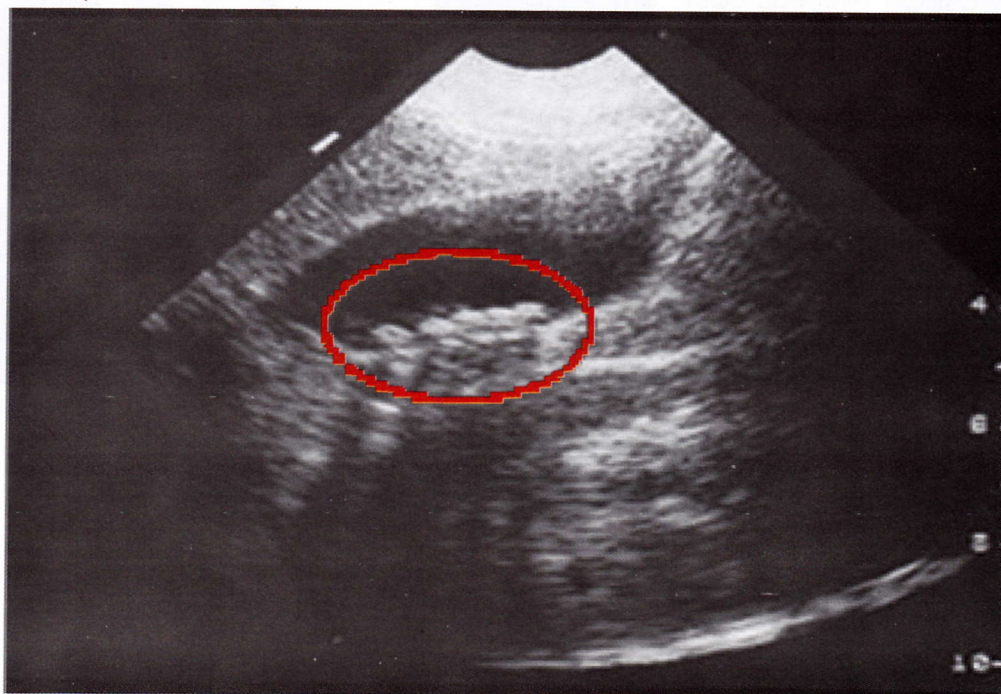
1- Ultra-sonography



Normal US of gall bladder



**Solitary stone gall bladder US
(with posterior acoustic shadow)**



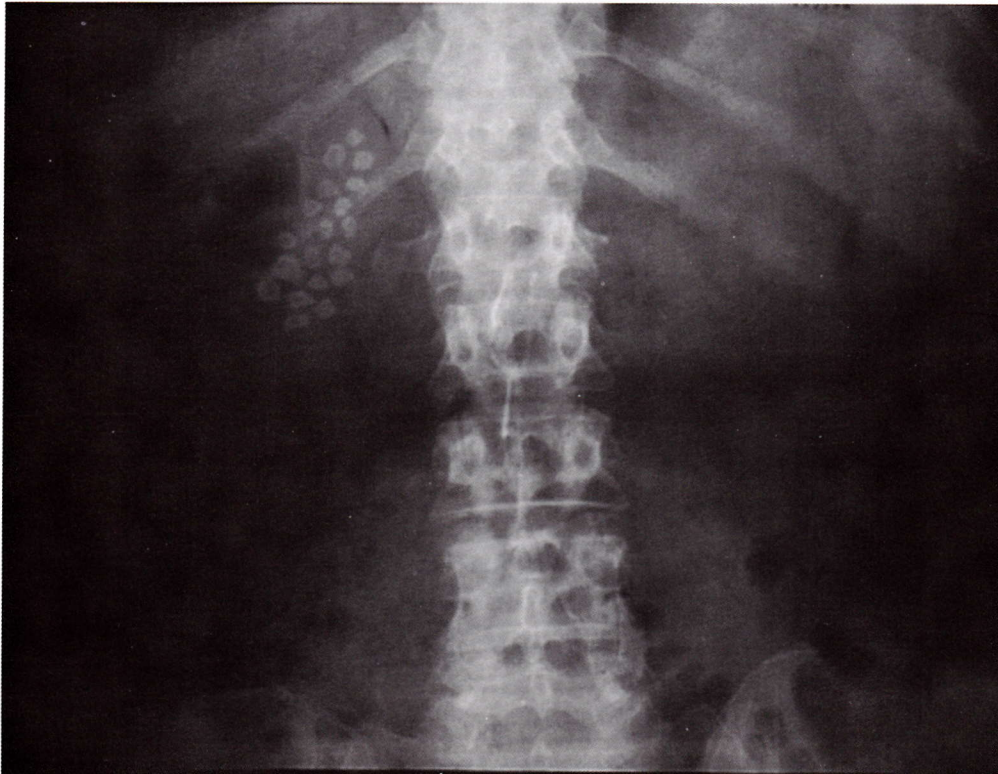
**Multiple stones gall bladder US
(with posterior acoustic shadow)**

■ Seen as echogenic foci.

2- Plain AP x-ray Right Hypochondrium

➡ **Note:**

- Normal gall bladder is not seen in plain x-ray.



Multiple stones gall bladder x-ray

- Seen as multiple small, faceted & calcified stones (only 10-15% of gall bladder stones are calcified enough to be seen in x-ray).



Porcelain gall bladder

- Seen as calcified gall bladder wall.

3- Oral Cholecystography {OCG}



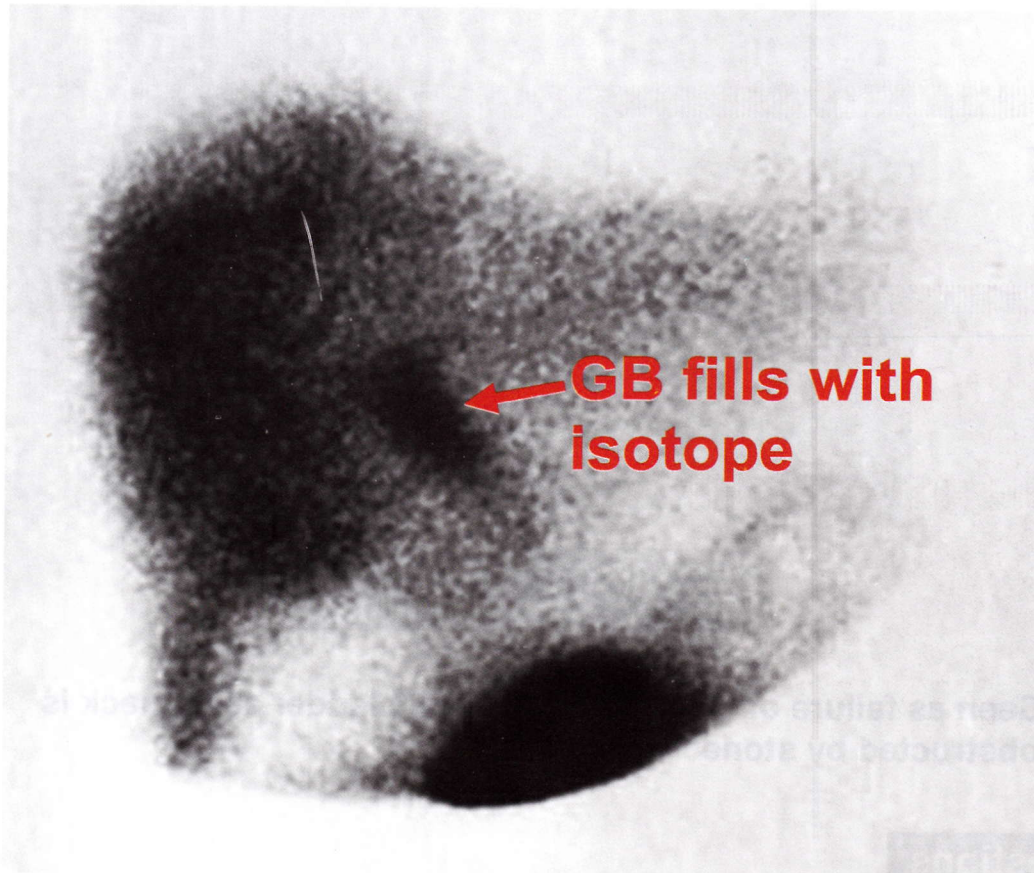
Normal oral cholecystography



Multiple stones gall bladder

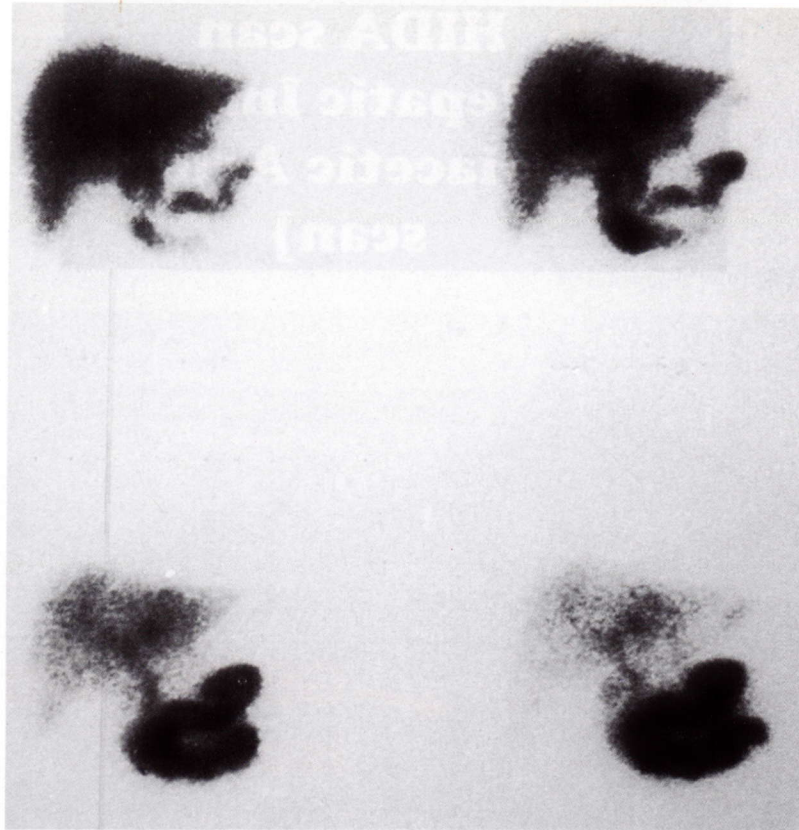
- Seen as multiple radiolucent filling defects.

4- HIDA scan {Hepatic Imino Diacetic Acid scan}



Normal HIDA scan

- Seen as concentration of the dye in gall bladder.



Acute cholecystitis

- Seen as failure of visualization of gall bladder as its neck is obstructed by stone

Questions

1. US is the investigation of choice of this condition. T
2. This condition is commonly seen among middle aged females. T
3. This condition may be complicated by acute pancreatitis. T
4. Lateral view film is important to differentiate a gall stone seen in AP x-ray from renal stone. T
5. Telepaque tablets are taken 12 hours before oral cholecystography. T
6. Porcelain gall bladder is a precancerous condition. T
7. Treatment of this condition is mainly medical. F

Obstructive Jaundice

1- ERCP

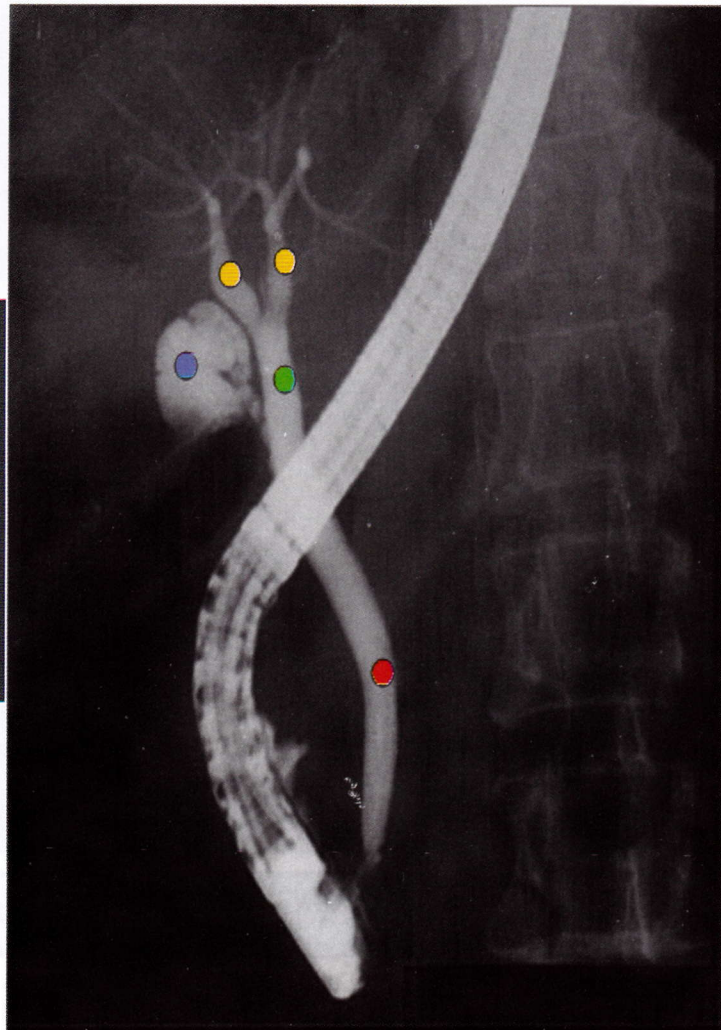
(Endoscopic Retrograde Cholangio-Pancreatography)

Common bile duct

Gall bladder

Common hepatic duct

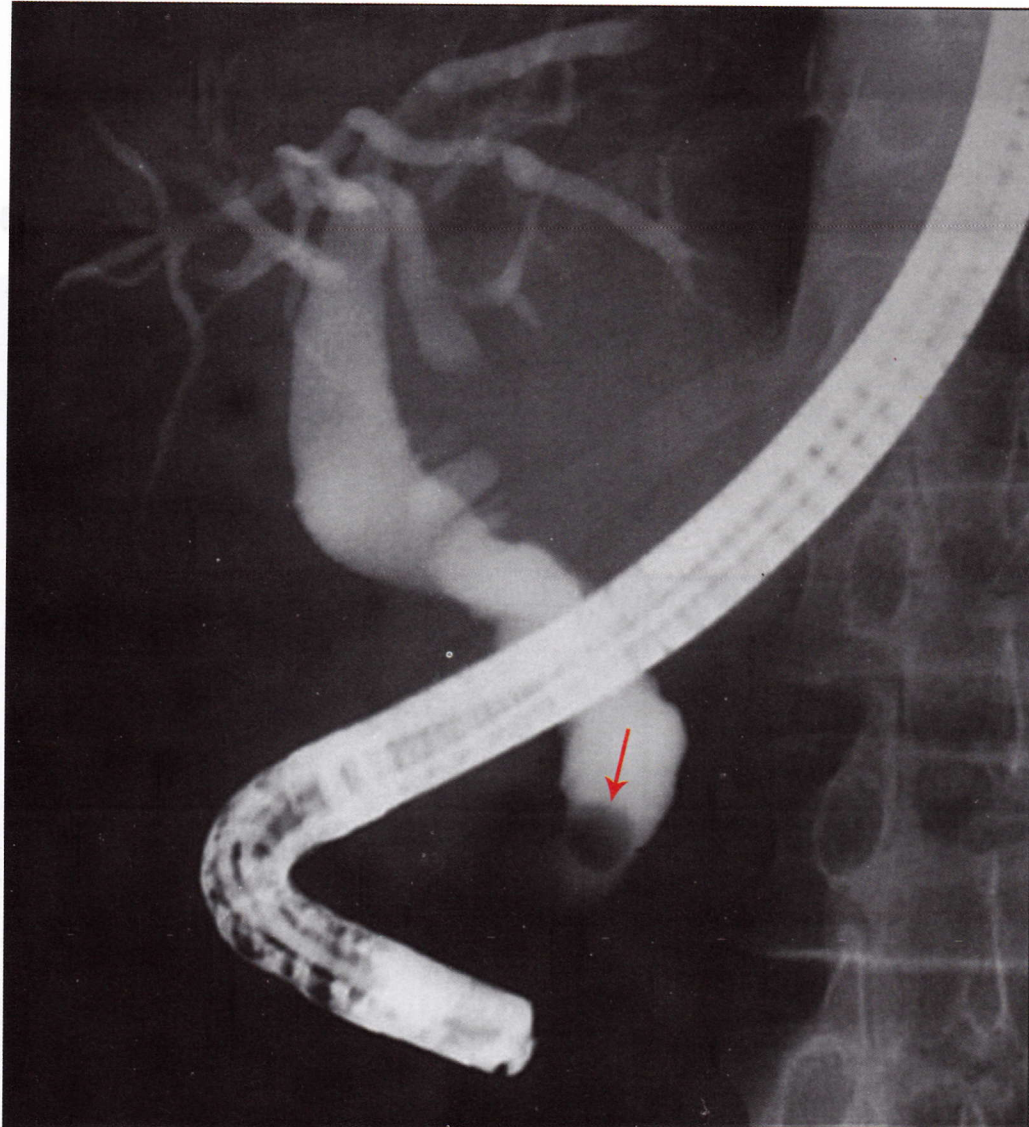
Rt. & Lt. hepatic ducts



Normal ERCP

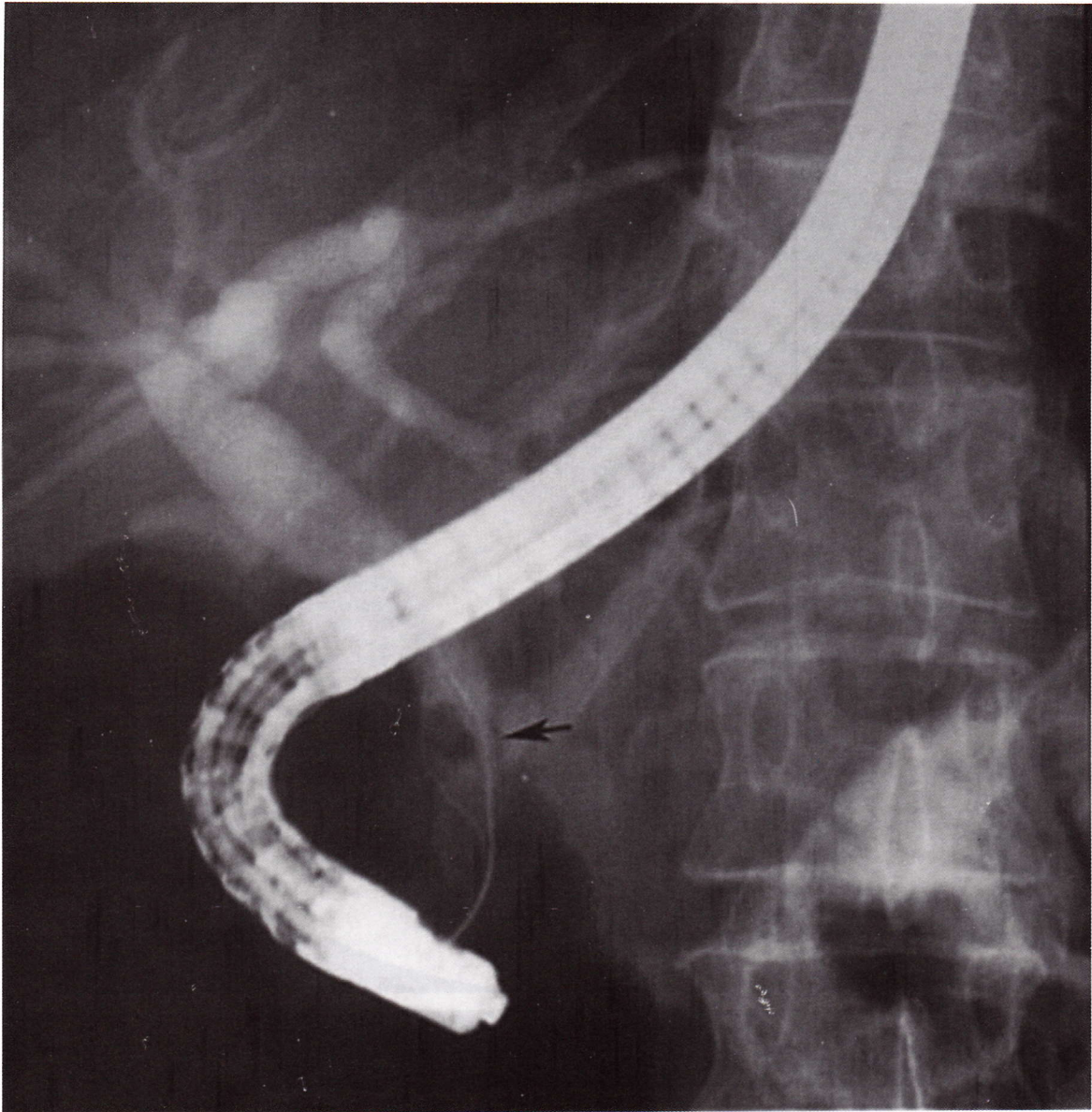
➡ **Notes:**

- The endoscope used to visualize & cannulate ampulla of Vater to inject dye.

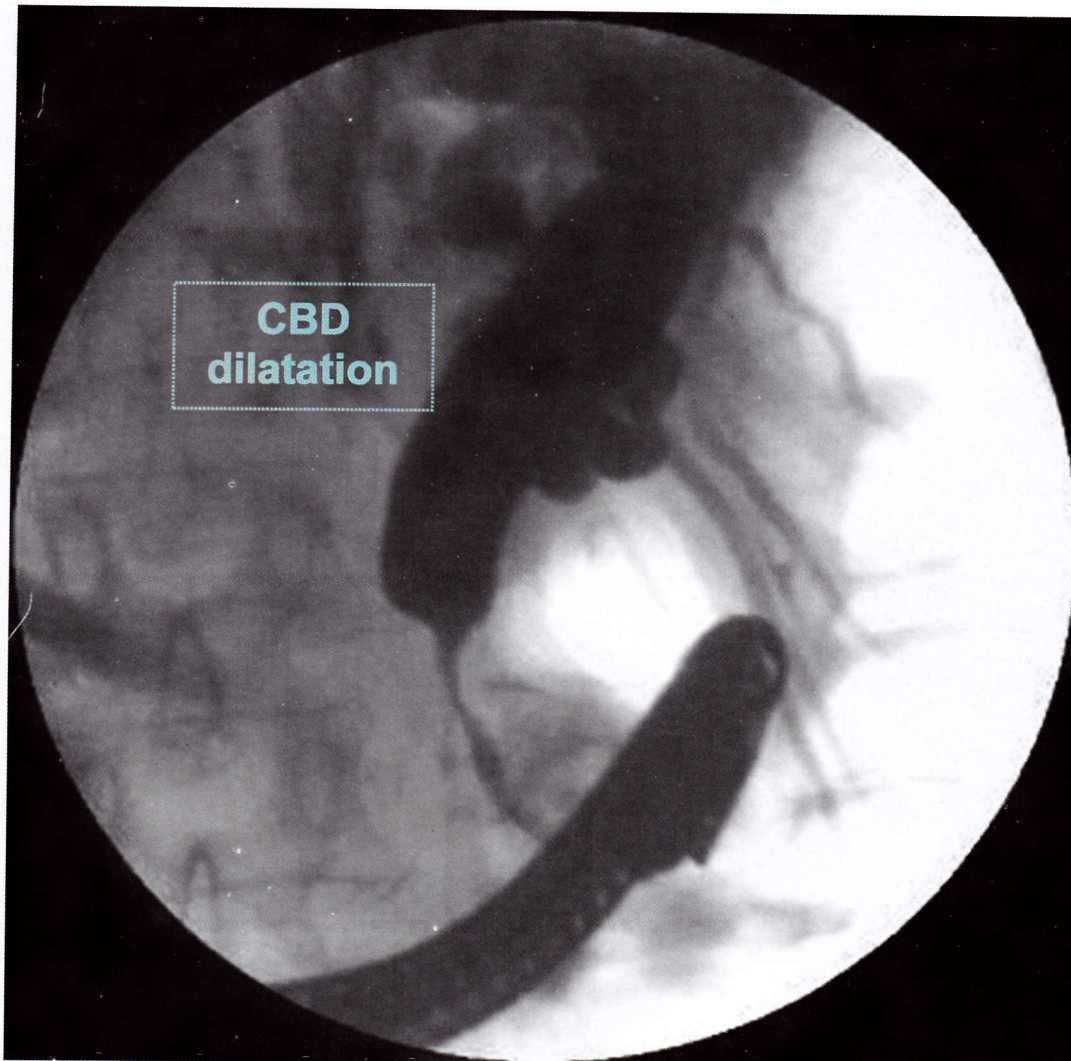


Common bile duct stone

- **Seen as radiolucent filling defect in the common bile duct with proximal dilatation.**



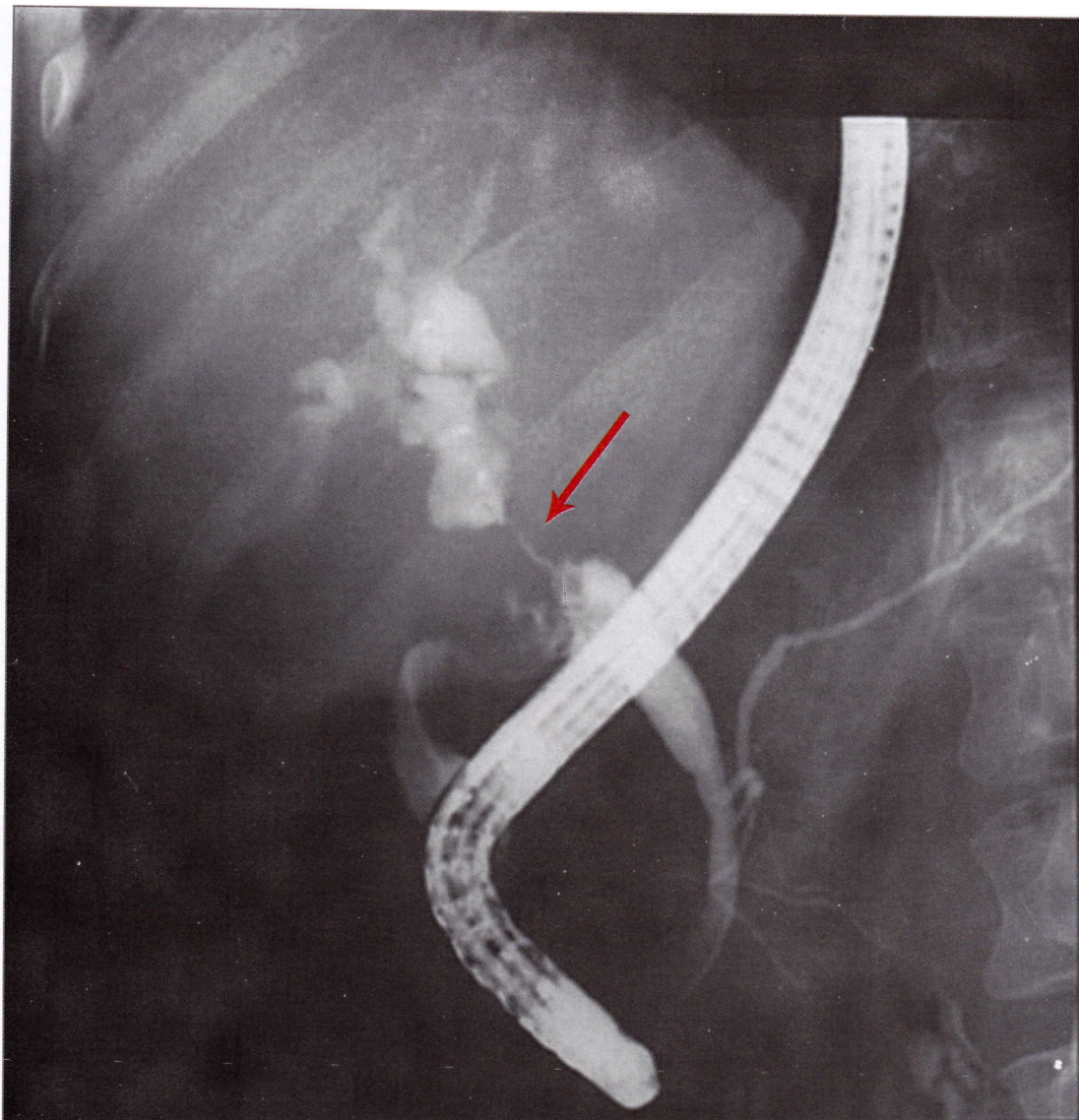
Stone extraction by Dormia basket



**CBD
dilatation**

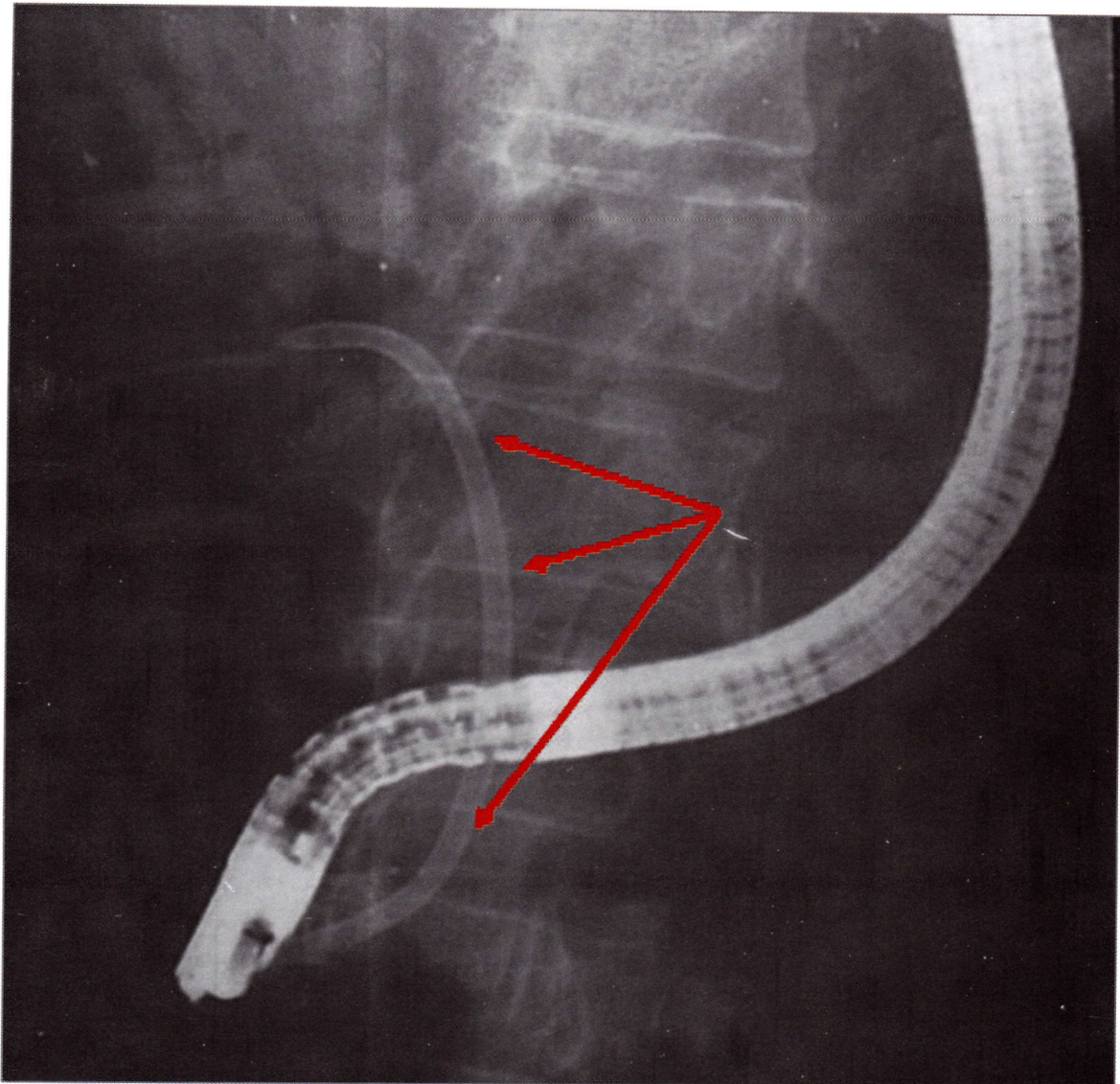
Cancer head of pancreas

- **Seen as stricture with irregular margins in the lower biliary duct with proximal dilatation.**



**Cholangiocarcinoma
(Klatskin tumor)**

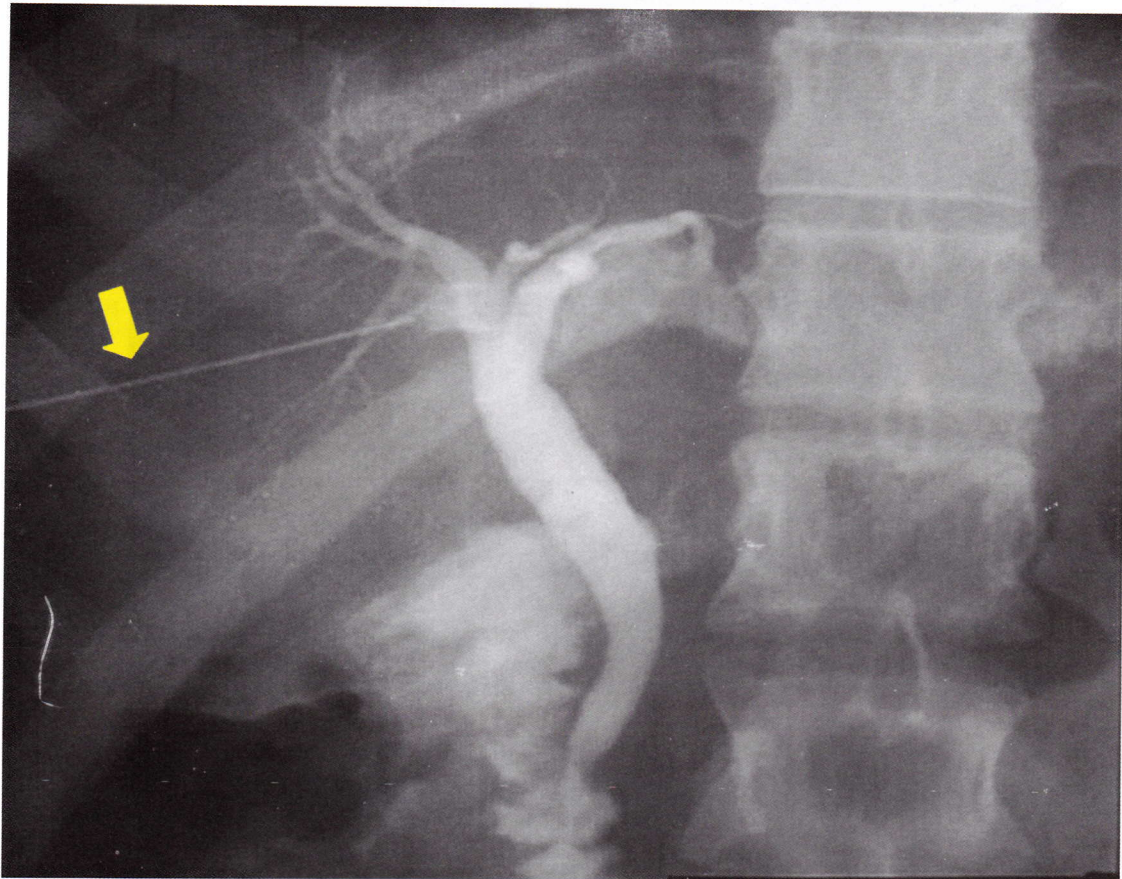
- Seen as short segment stricture with irregular margins in the upper biliary ducts with proximal dilatation.



- Stent in common bile duct inserted for palliative treatment of malignant obstructive jaundice.

2- PTC

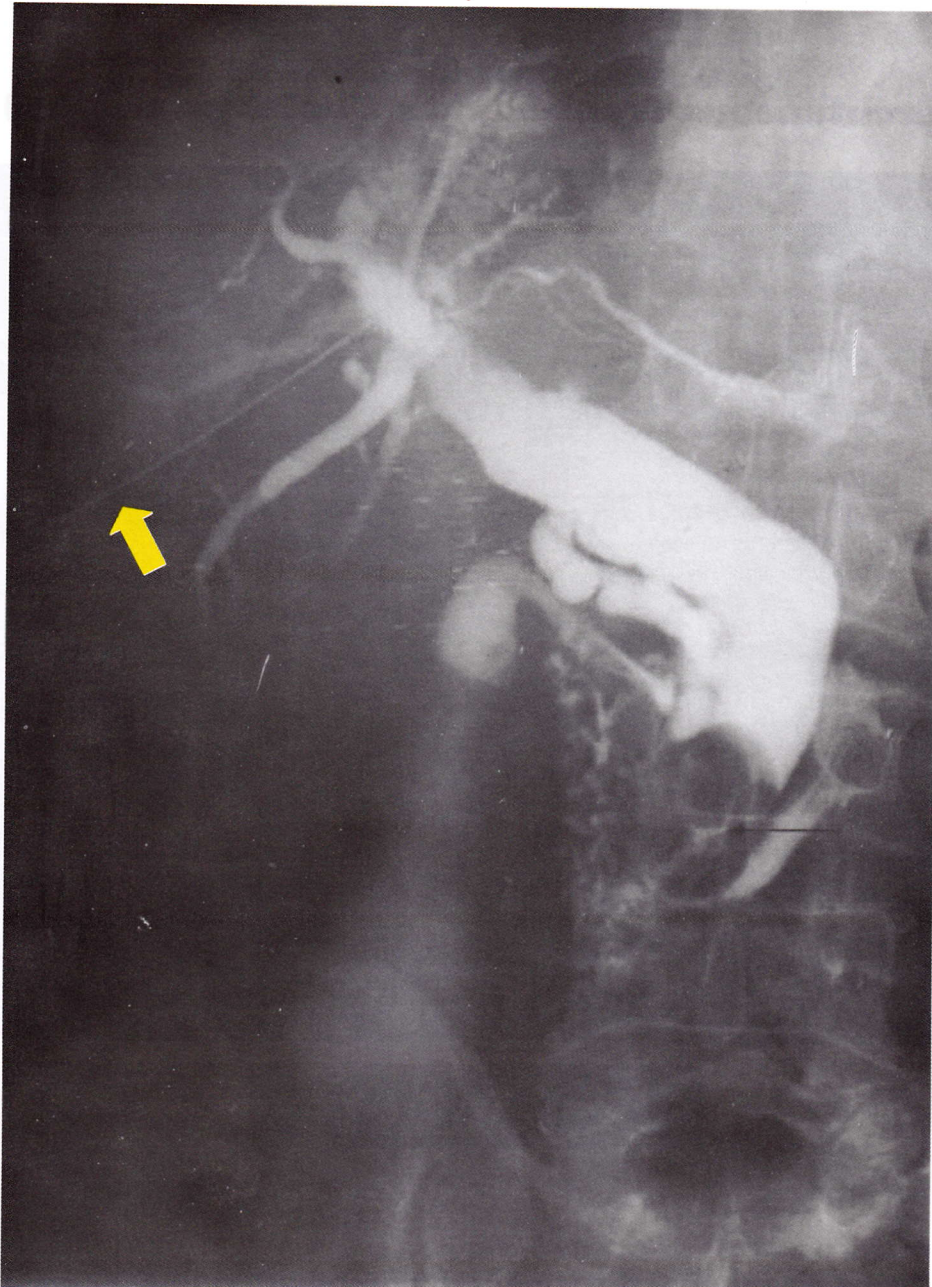
(Percutaneous Trans-hepatic Cholangiography)



Normal PTC

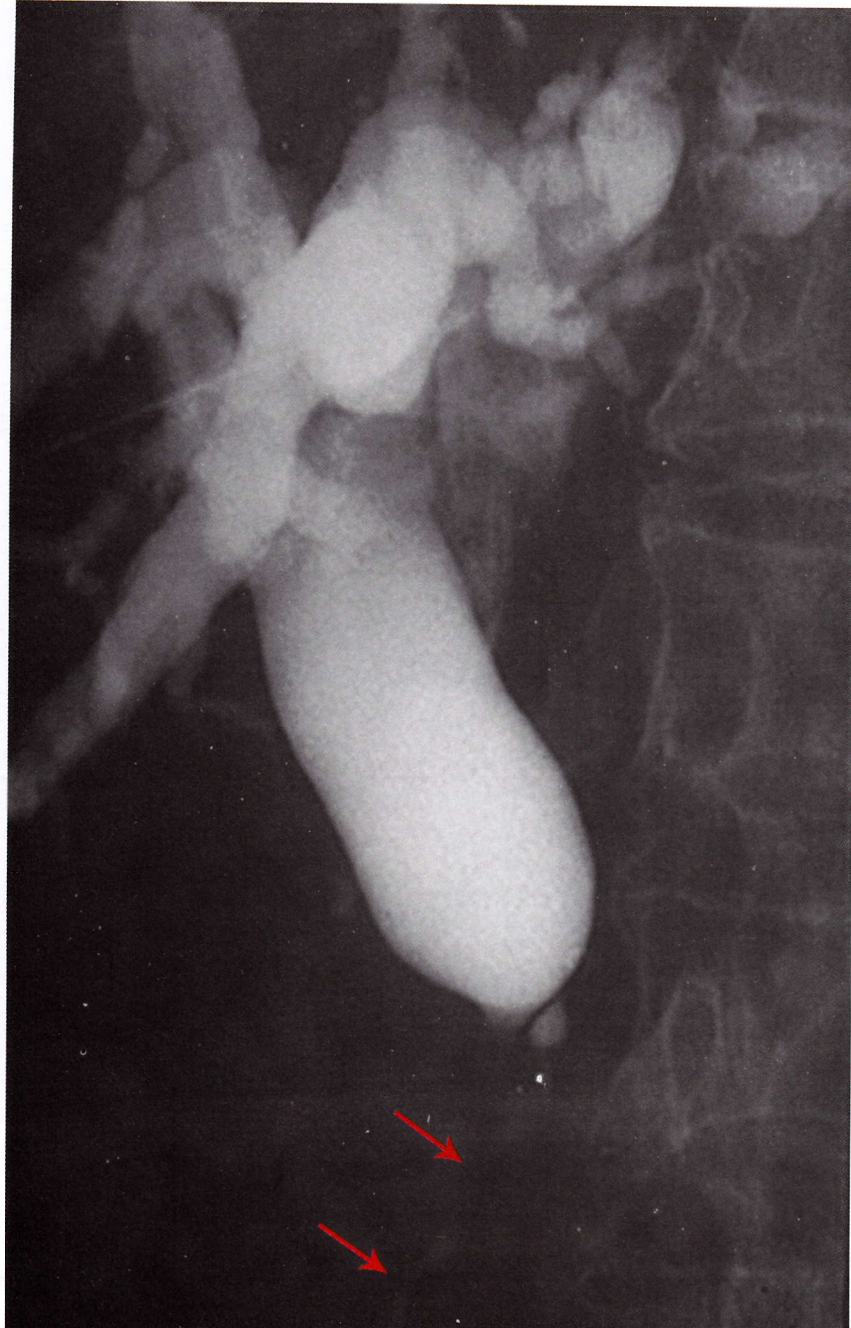
➡ **Note:**

- The Chiba needle used to inject dye in biliary ducts.



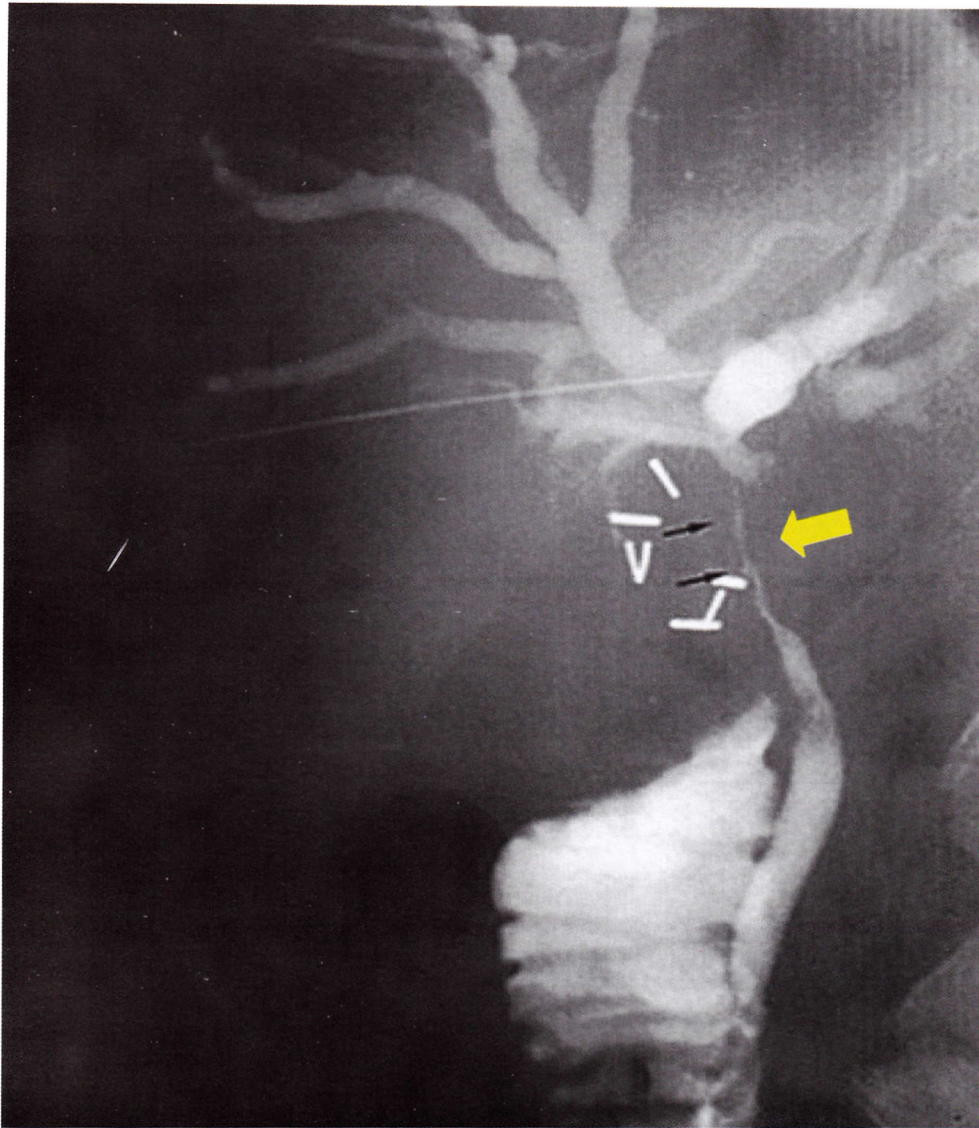
Stone in lower bile duct

■ Seen as radiolucent filling defect.



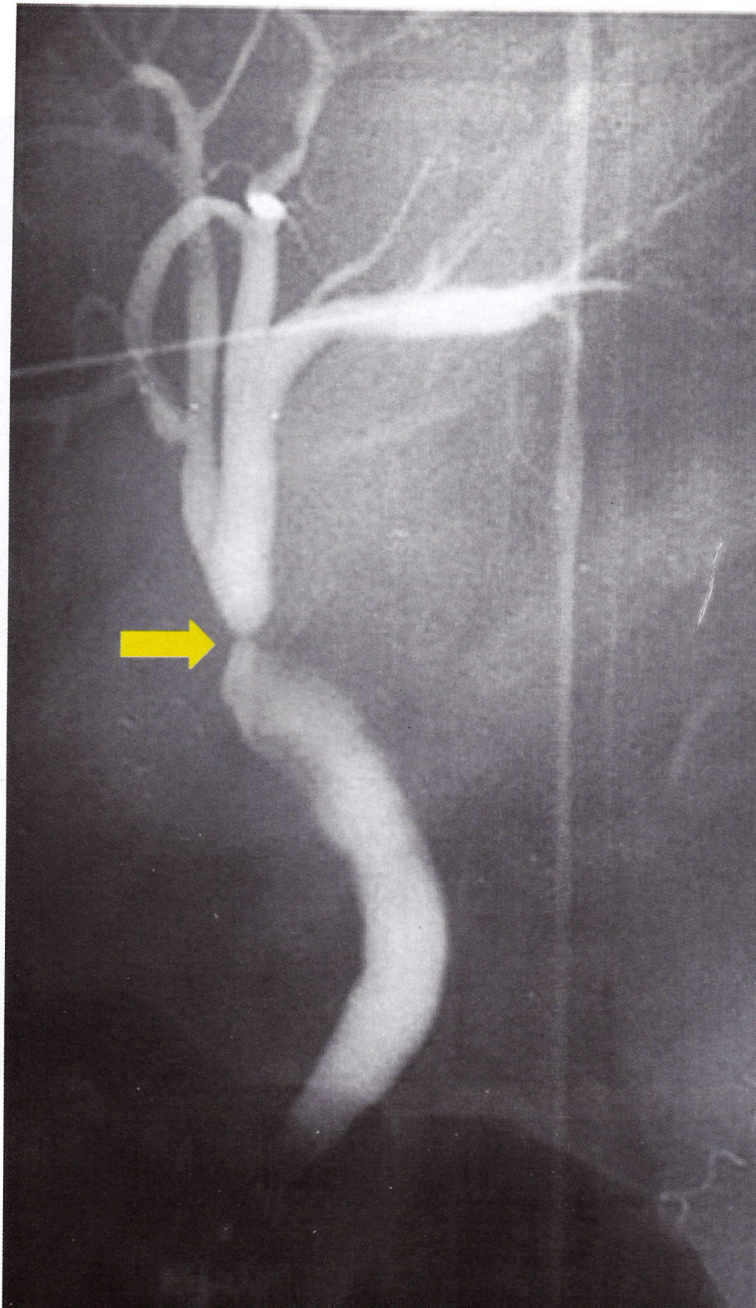
Cancer head of pancreas

- Seen as stricture with irregular margins in the lower biliary duct with proximal dilatation.



Cholangiocarcinoma

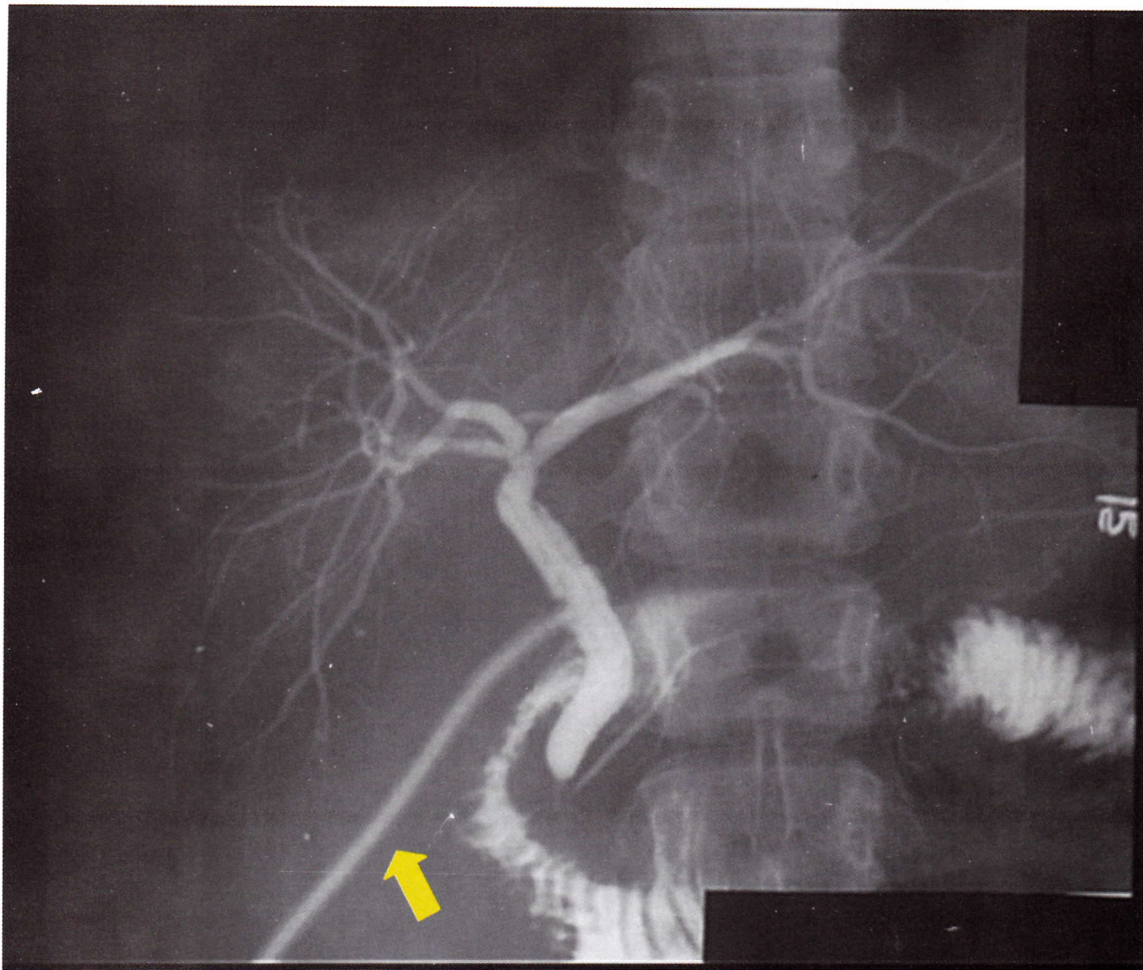
- Seen as short segment stricture with irregular margins in the upper biliary ducts with proximal dilatation.



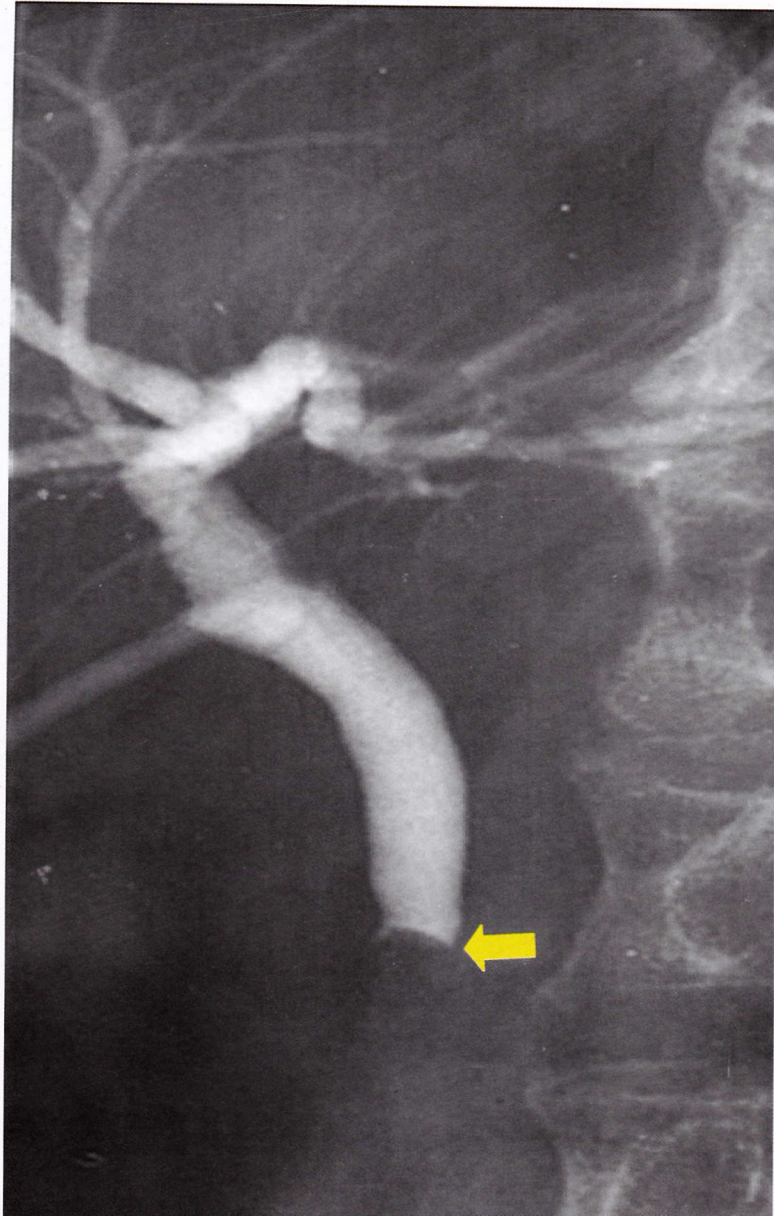
Benign stricture

- Seen as short segment stricture in the middle of common bile duct in a patient with previous cholecystectomy (benign strictures are mostly iatrogenic).

3- T-tube Cholangiography

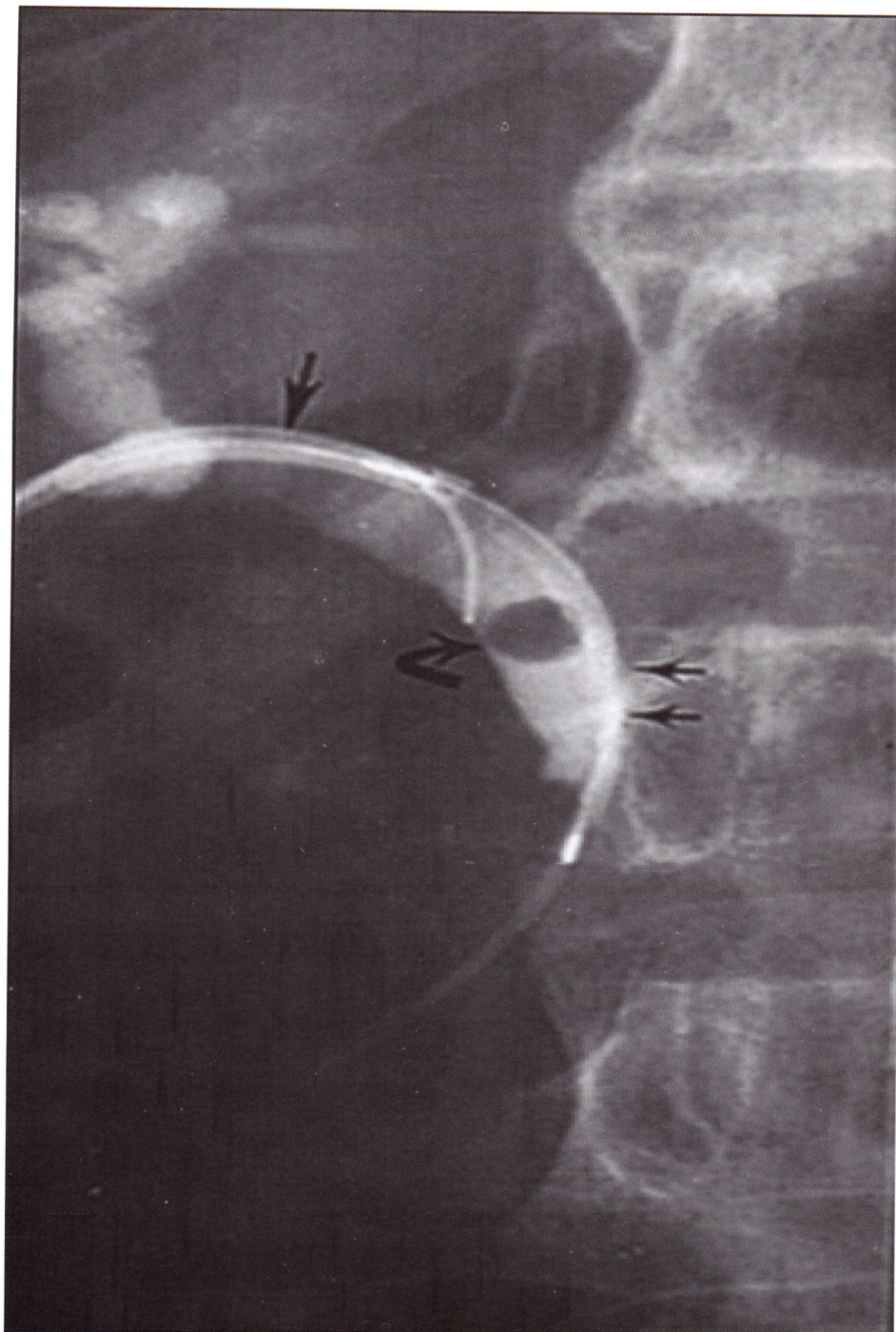


Normal T-tube cholangiography



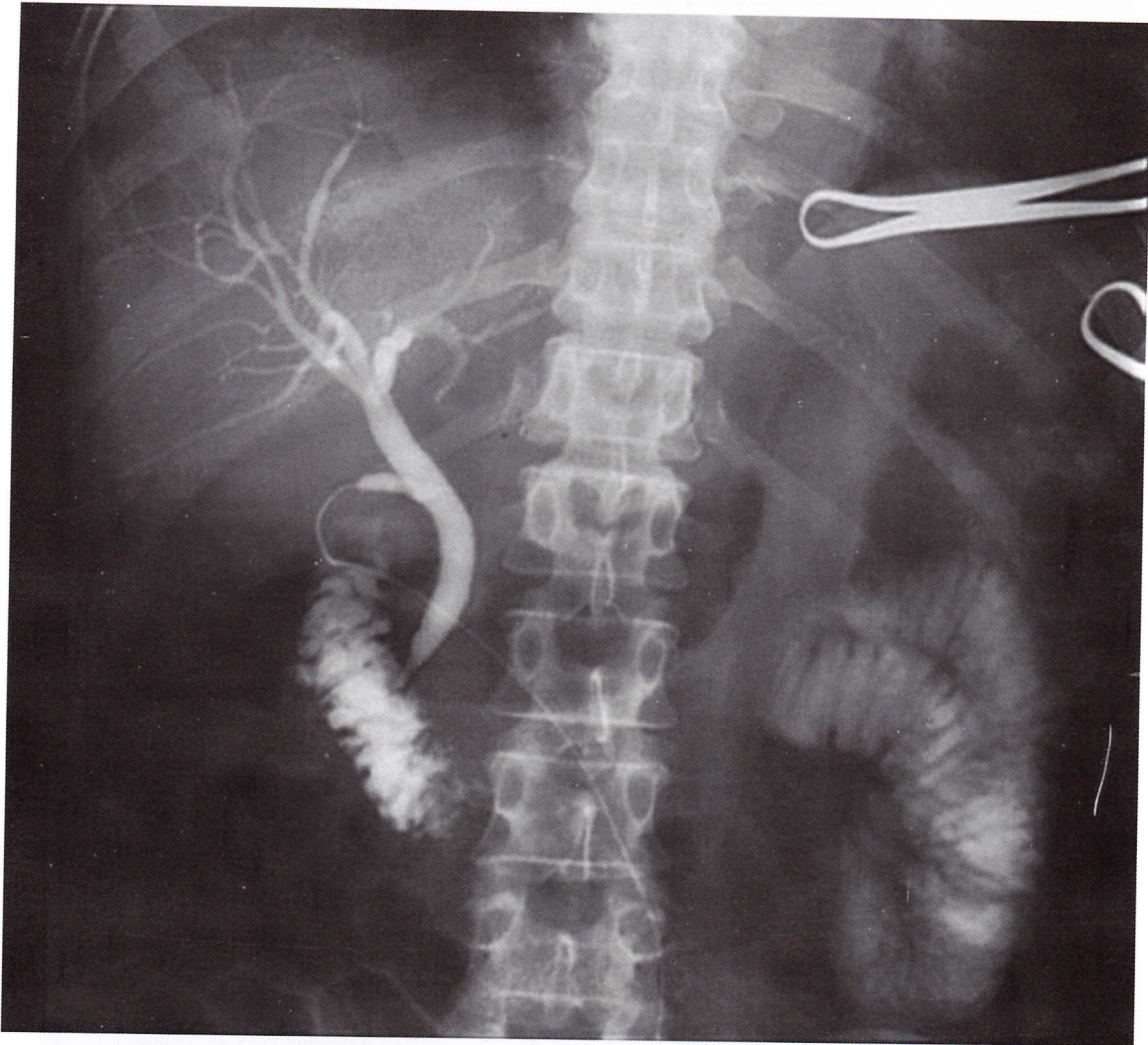
**Common bile duct stone
T-tube cholangiography**

- Seen as meniscoid filling defect obstructing flow of the dye.



Stone extraction by Dormia basket through T-tube tract

4- Intra-operative Cholangiography

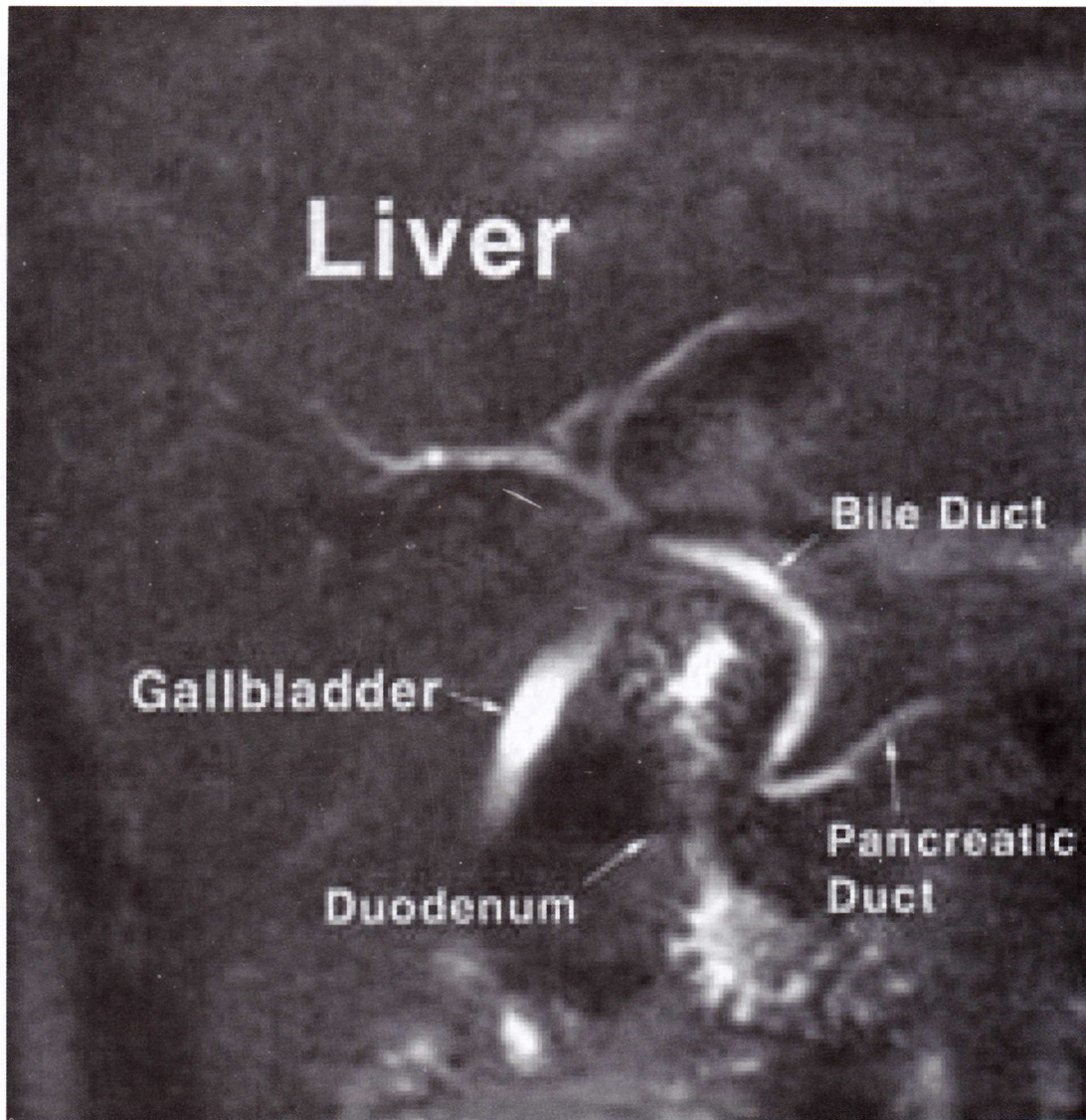


**Normal intra-operative
cholangiography**

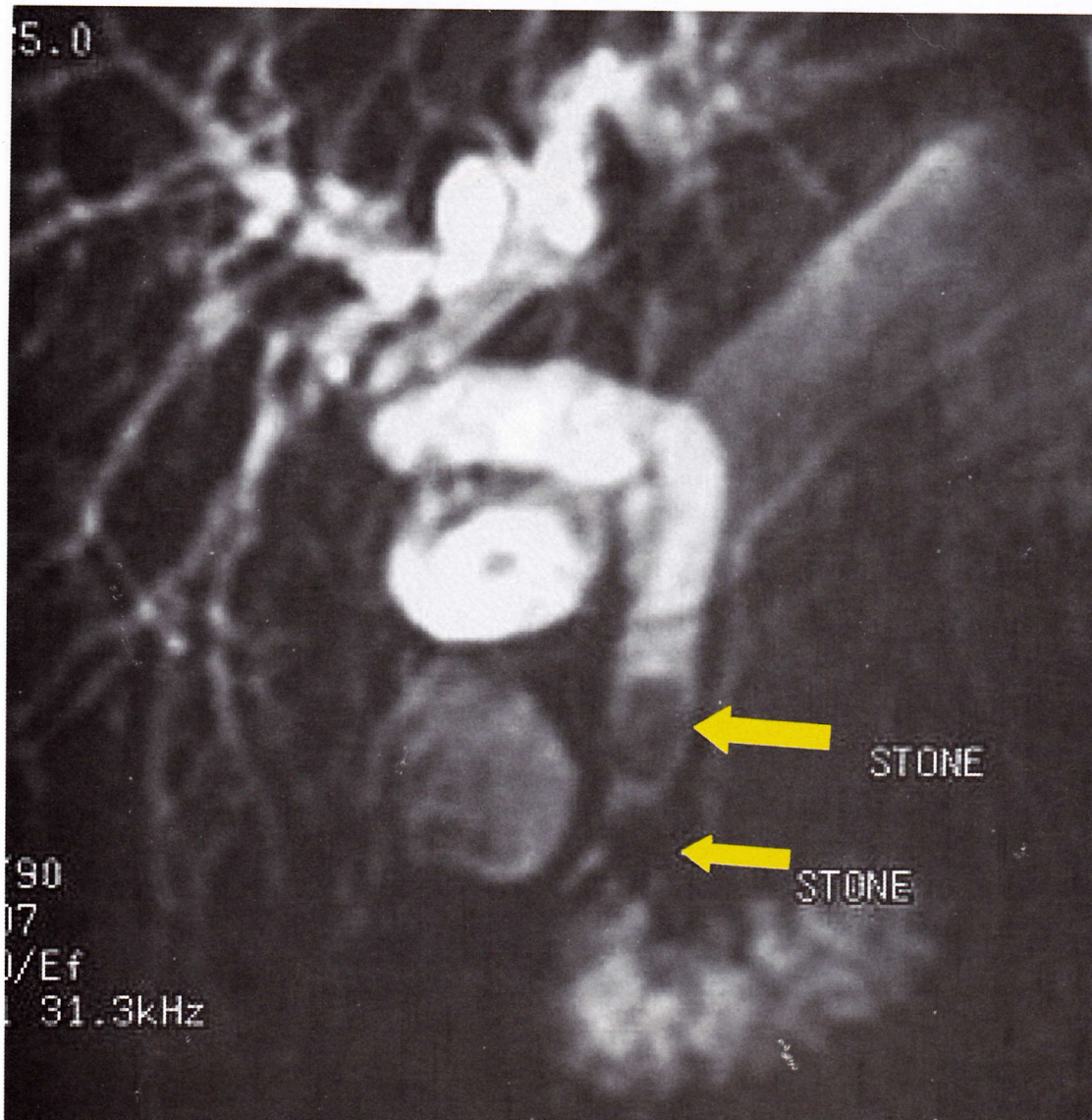
- Done through cannulation of common bile duct intra-operative to assess common bile duct stones to determine the need of common bile duct exploration.

5- MRCP

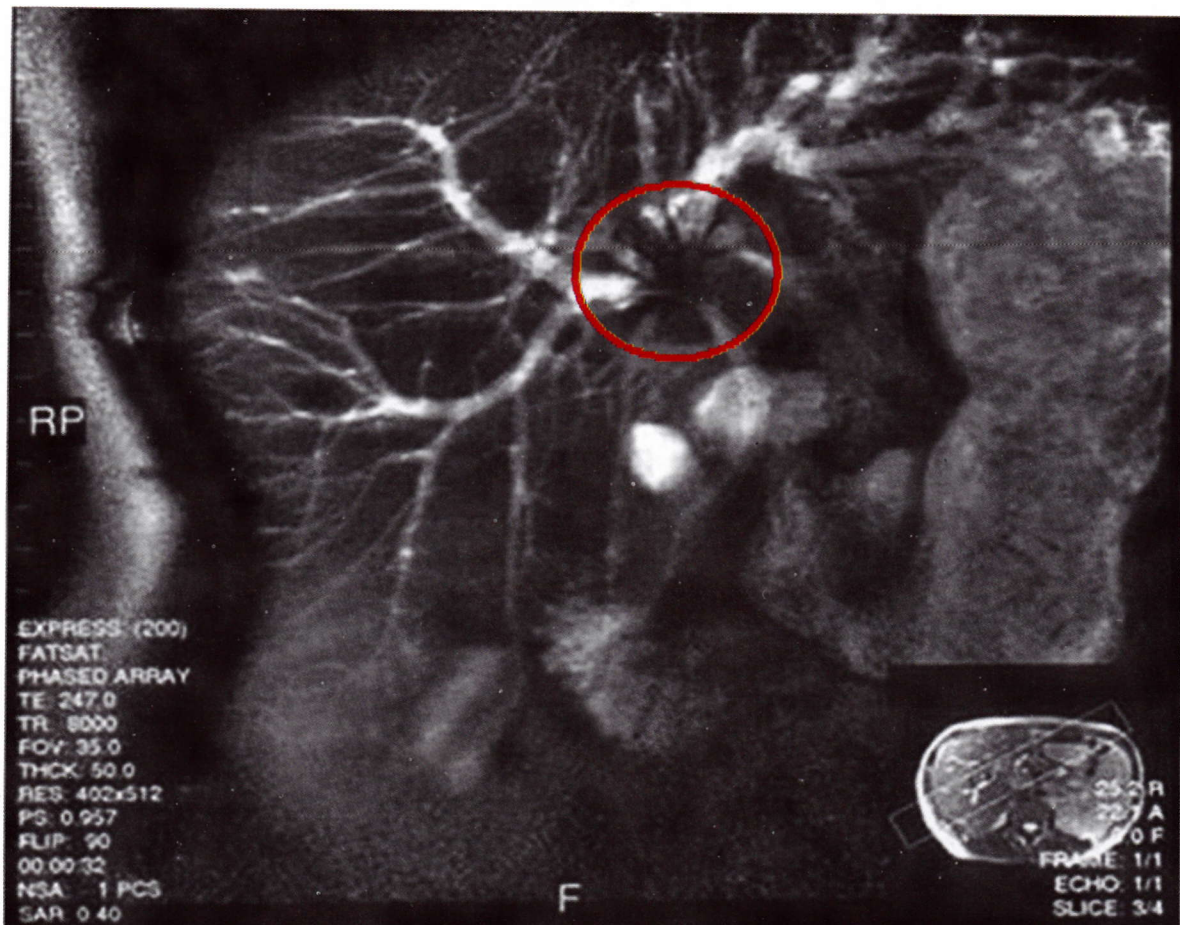
(Magnetic Resonance Cholangio-Pancreatography)



Normal MRCP



Common bile duct stones MRCP



Cholangiocarcinoma MRCP

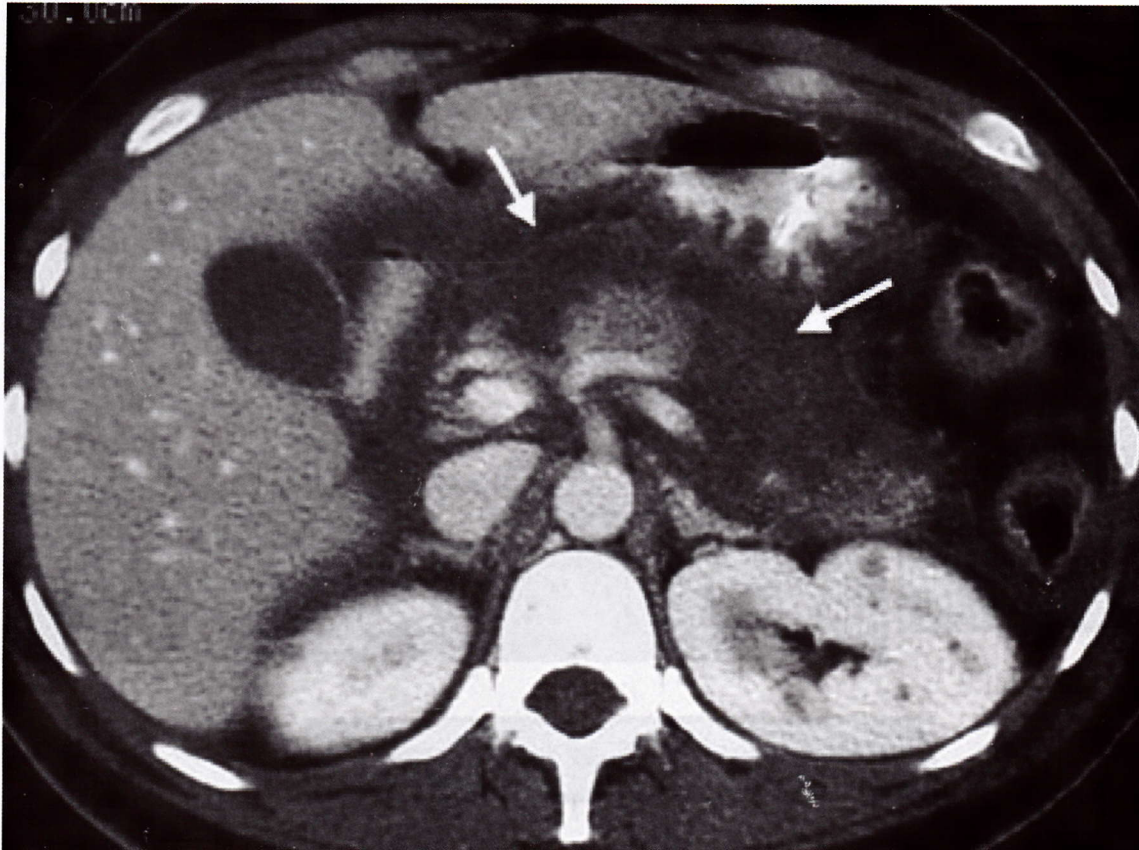
Questions

1. Stones in common bile duct are found in 30% of patients undergoing cholecystectomy.
2. Bleeding tendency is a contraindication to ERCP.
3. Bleeding tendency can be corrected by IV vitamin K.
4. Pancreatitis is a possible complication of ERCP.
5. Abdominal US is essential investigation before ERCP.
6. The dye used for T-tube cholangiography is urographin.
7. T-tube cholangiography is done 2 days after cholecystectomy.

T
F
T
T
T
T
F

Pancreas

Acute pancreatitis



■ The pancreas is thickened and edematous.

Questions

1. This condition causes severe symptoms with minimal signs. **T**
2. This condition could be complicated by cyst formation in the lesser sac. **T**
3. Serum amylase is helpful investigation for diagnosis of this condition. **T**

Pancreatic cancer

Liver

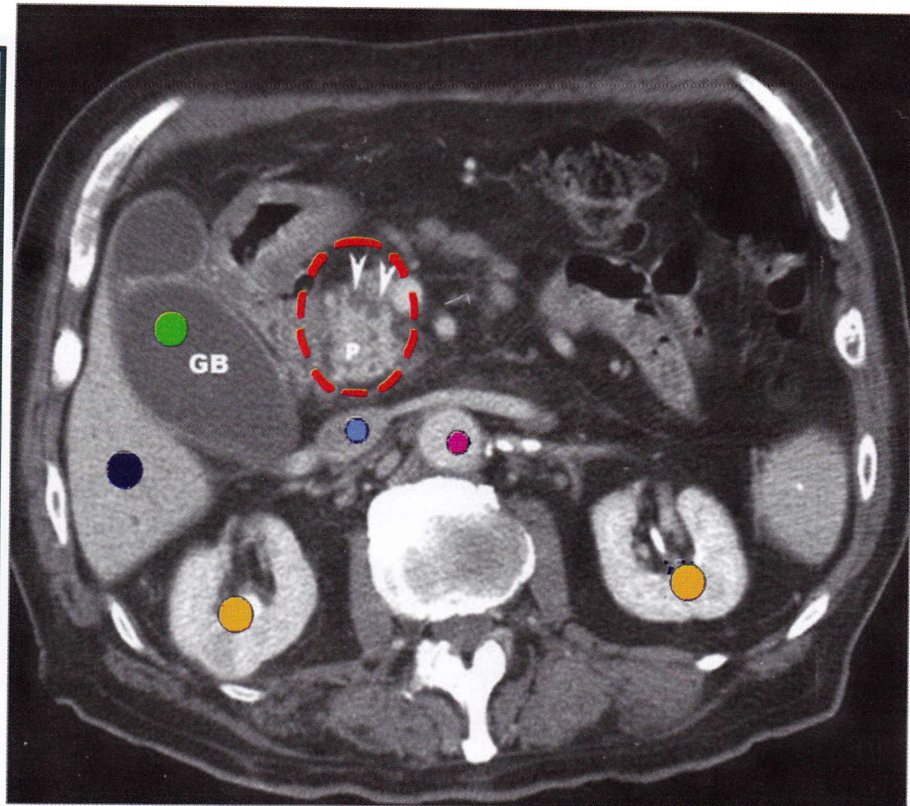
Gall bladder
(markedly
dilated)

Cancer head

kidney

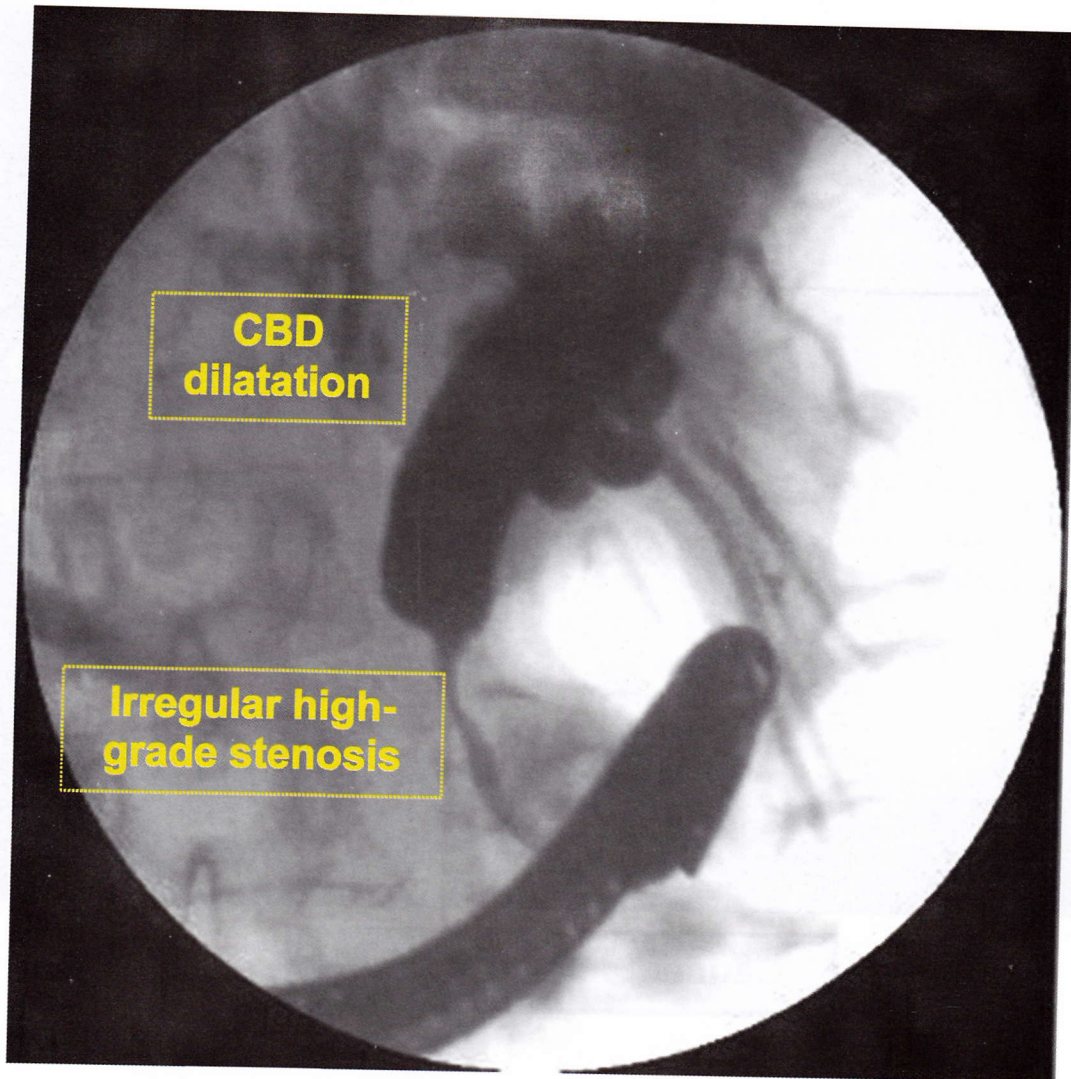
IVC

Aorta

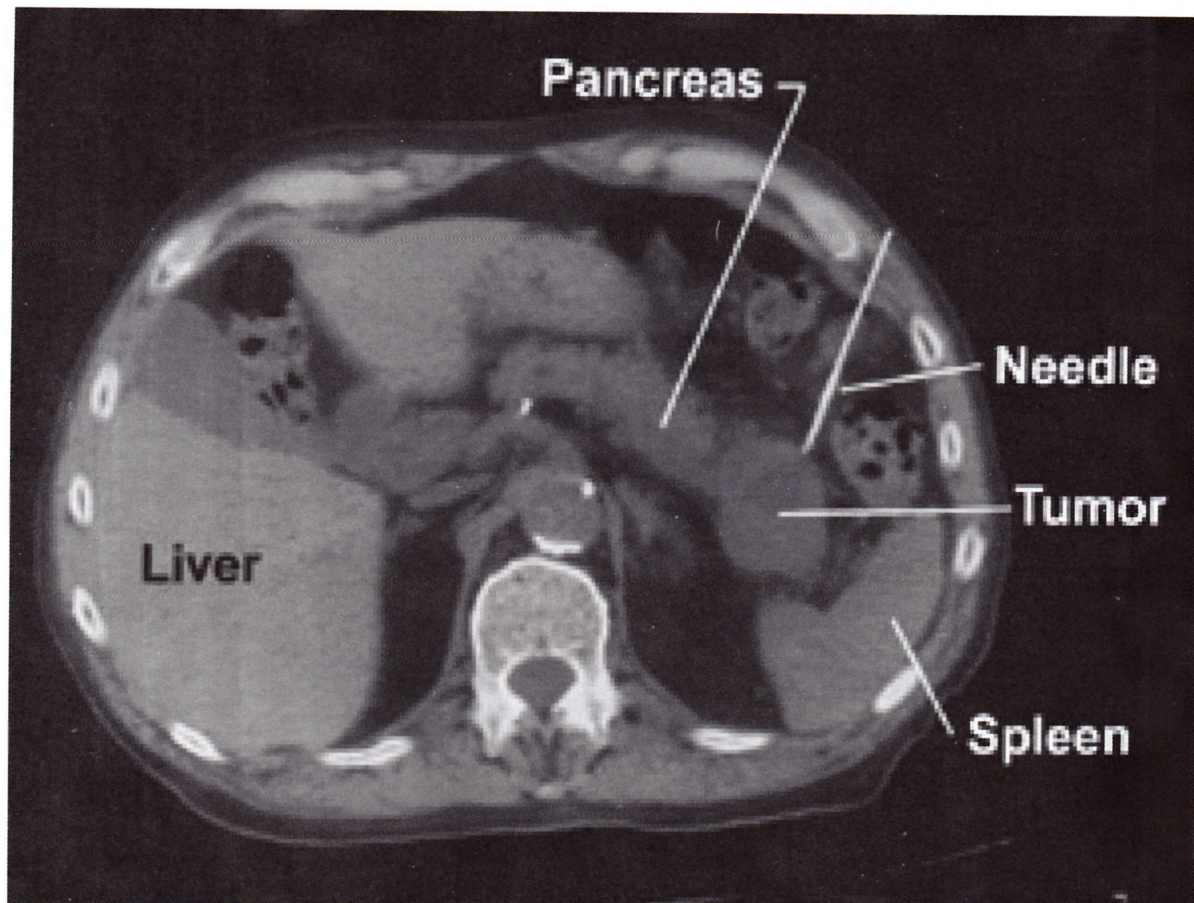


Cancer head of pancreas

- Seen as mass in the head of pancreas may be associated with gall bladder mass.



ERCP



Cancer tail of pancreas

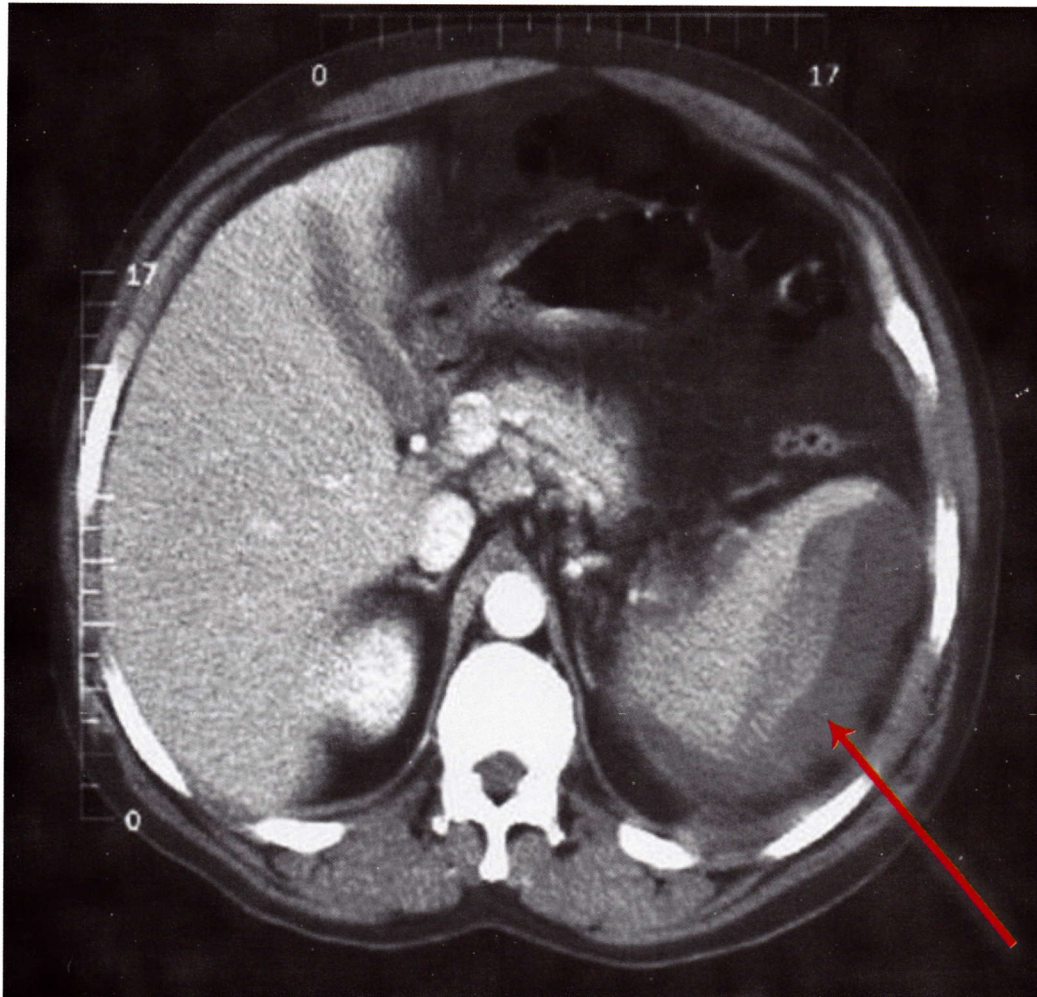
- Seen as a mass in the tail of pancreas.

Questions

1. Cancer pancreas usually arises in the tail. F
2. Main presentation of cancer head of pancreas is painless obstructive jaundice. T
3. Most patients of this condition are curable by surgery at presentation. F

Spleen

Splenic Injury (Rupture Spleen)



- Seen as laceration in the spleen with free intraperitoneal fluid adjacent to spleen (peri-splenic hematoma).

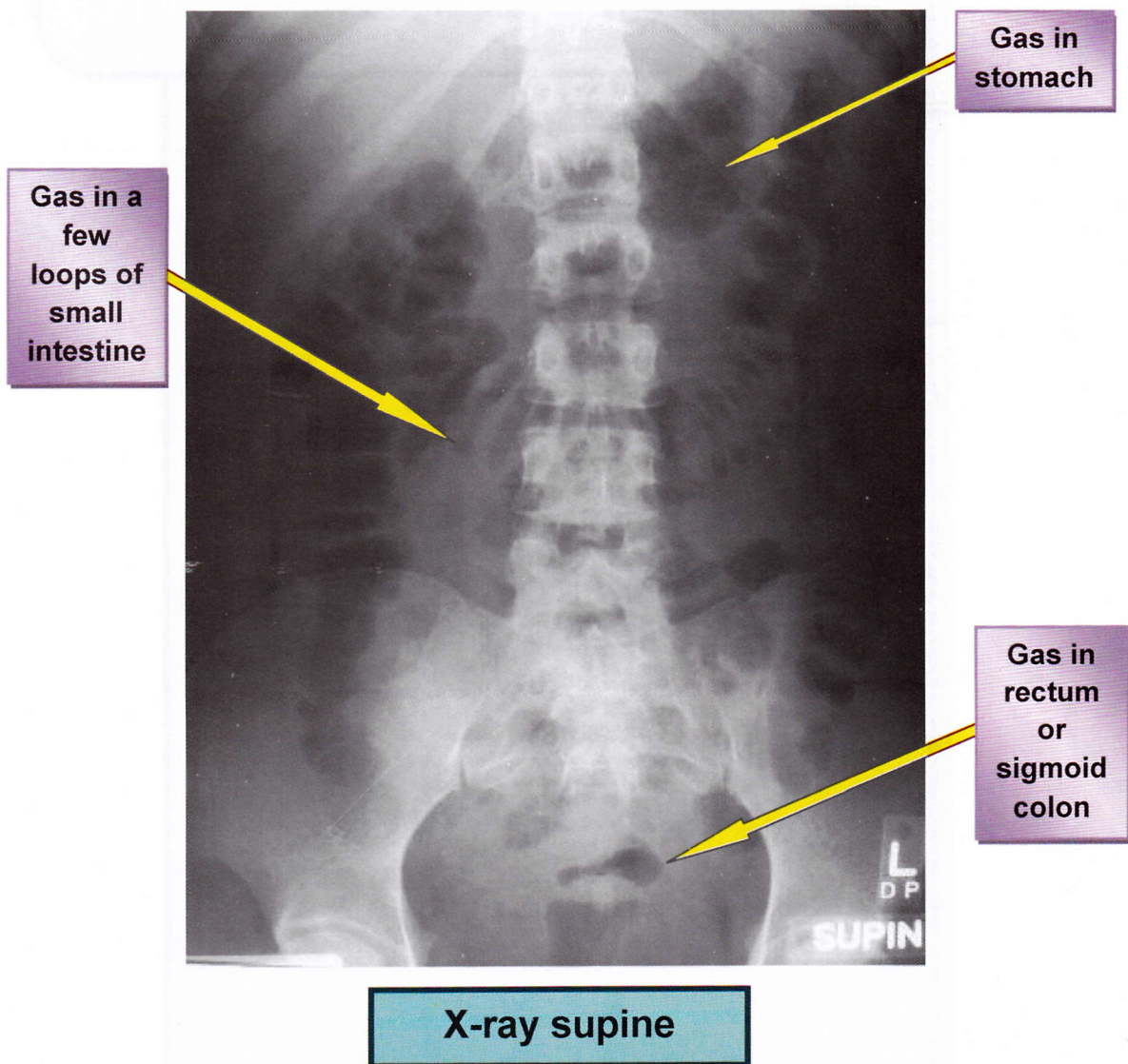
Questions

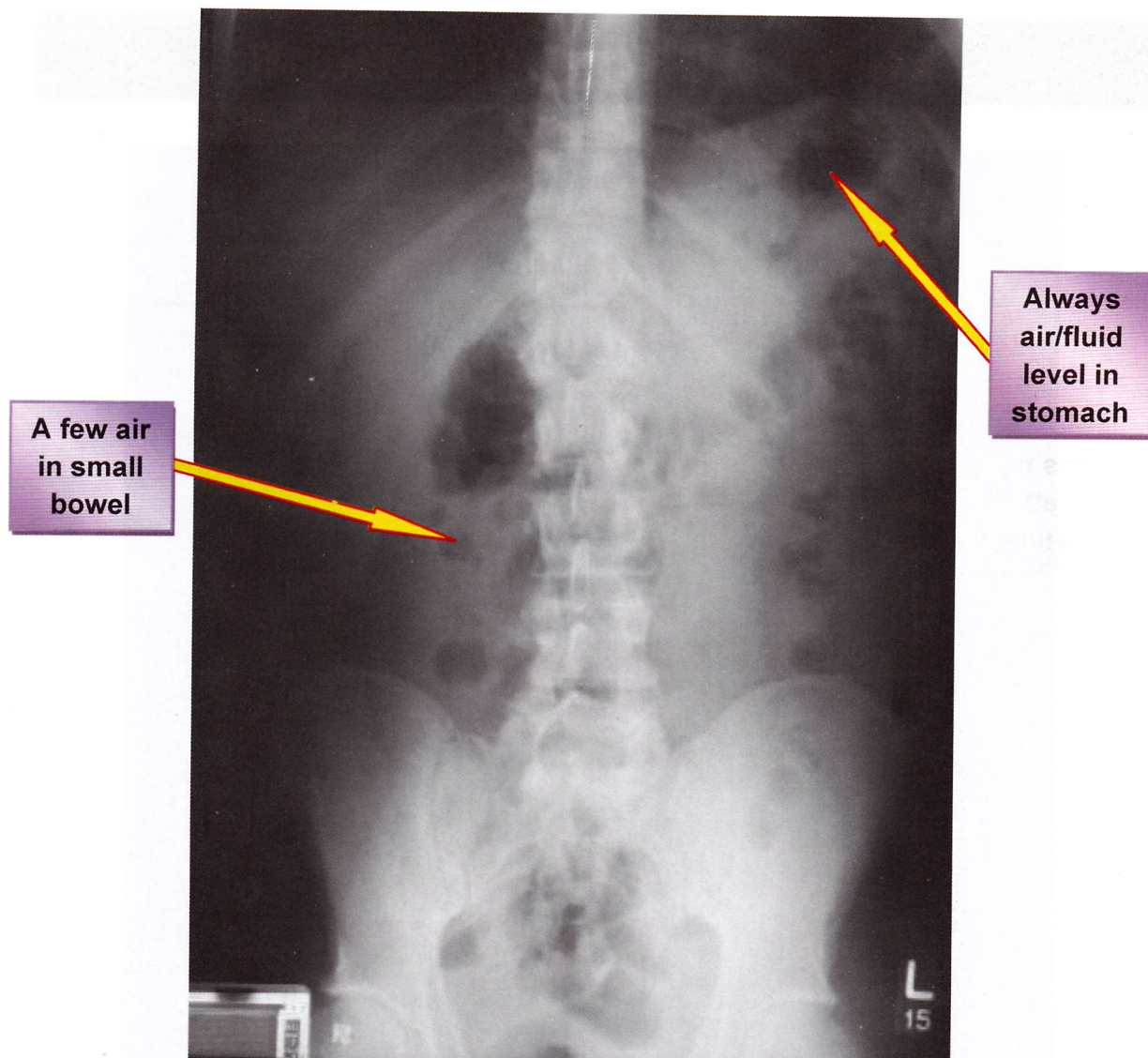
1. Spleen is the most common visceral organ to rupture following blunt trauma. T
2. Cullen sign may be present. T
3. Splenectomy is the main line of treatment of this condition in adults. T

-5-

Intestine Radiology

Normal Gas Pattern in Intestine





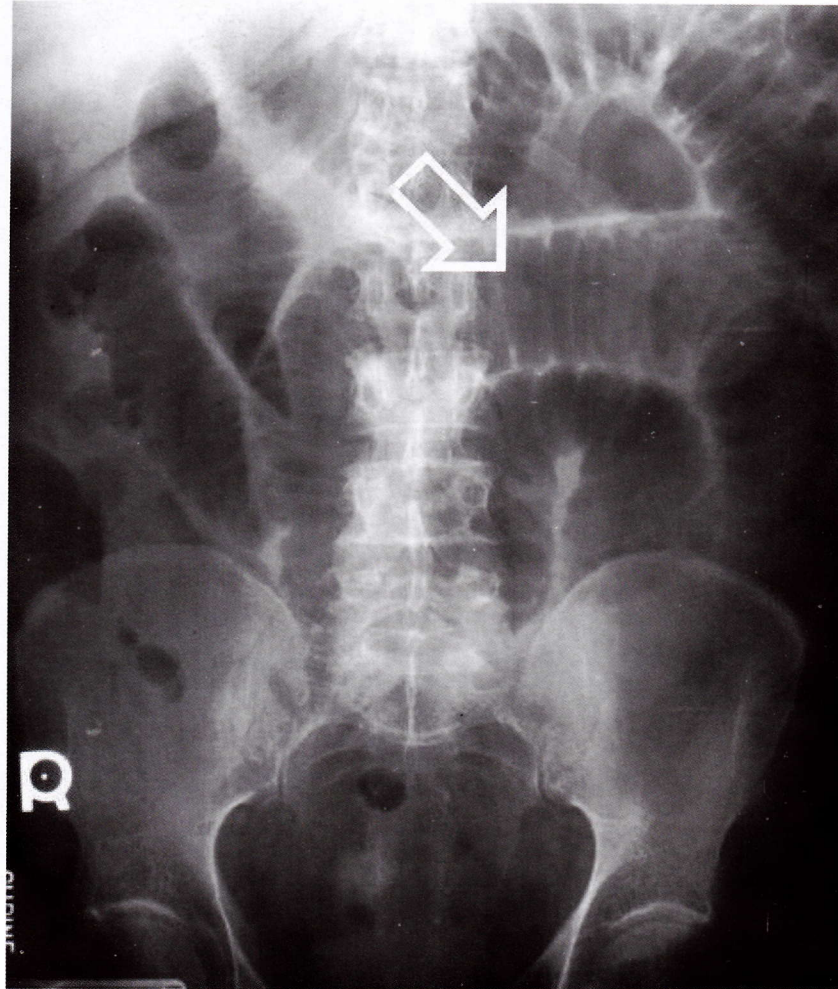
X-ray erect

■ Showing normal gas pattern.

Normal Barium Enema



Intestinal Obstruction



Small intestinal obstruction
x-ray supine

- Showing dilated loops in central abdomen having mucosal folds crossing all the lumen from one side to the other (valvulae conniventes or plicae circulares) seen in jejunal loops.
- While ileal loops appear as dilated loops with no mucosal pattern.



**Large intestinal obstruction
x-ray supine**

- Showing dilated loops in periphery of abdomen having haustrations not crossing all the lumen.



**Intestinal obstruction
x-ray erect**

■ Showing multiple fluid levels at different levels.

Questions

1. The etiology of intestinal obstruction may be mechanical or functional. **T**
2. Patients with intestinal obstruction present with painless abdominal distention. **F**
3. Patients with paralytic ileus have frequent intestinal sounds. **F**
4. Tenderness & rigidity necessitate urgent laparotomy. **T**
5. Initial management is naso-gastric suction & IV fluids. **T**

Pneumoperitoneum



- Showing that both mucosal & serosal surfaces of the bowel are outlined by gas indicating presence of free gas within peritoneal cavity.

Questions

1. This condition is caused by rupture viscous organ. T
2. In erect x-ray film for this patient, free air under diaphragm is seen. T

Sigmoid Volvulus



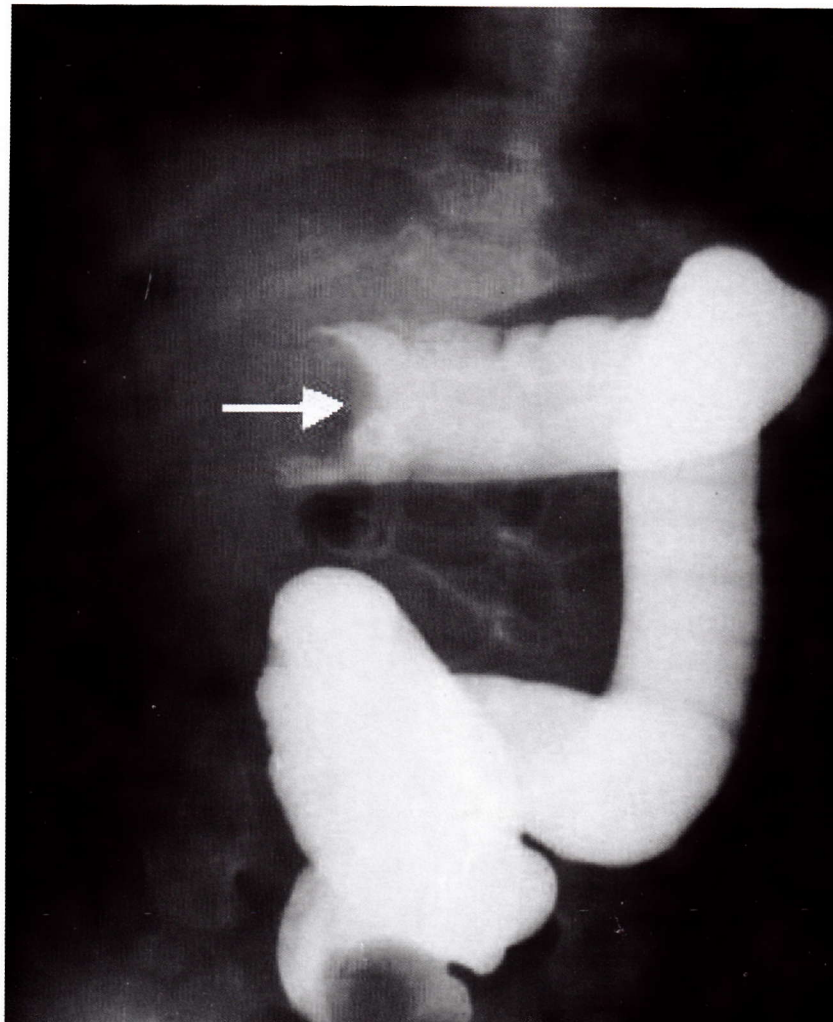
- Showing dilated sigmoid colon extending from the pelvis to upper abdomen seen as dilated inverted U shaped loop.

Questions

1. This x-ray shows coffee bean sign.
2. This condition is common in young aged persons.
3. Early cases can be treated by colonoscopic decompression.

T
F
T

Intussusception



■ Barium enema

- The colon is filled with barium until it stops in the area of intussusception seen as mass arresting progress of barium with trace of barium seen on both sides of the mass (claw sign).

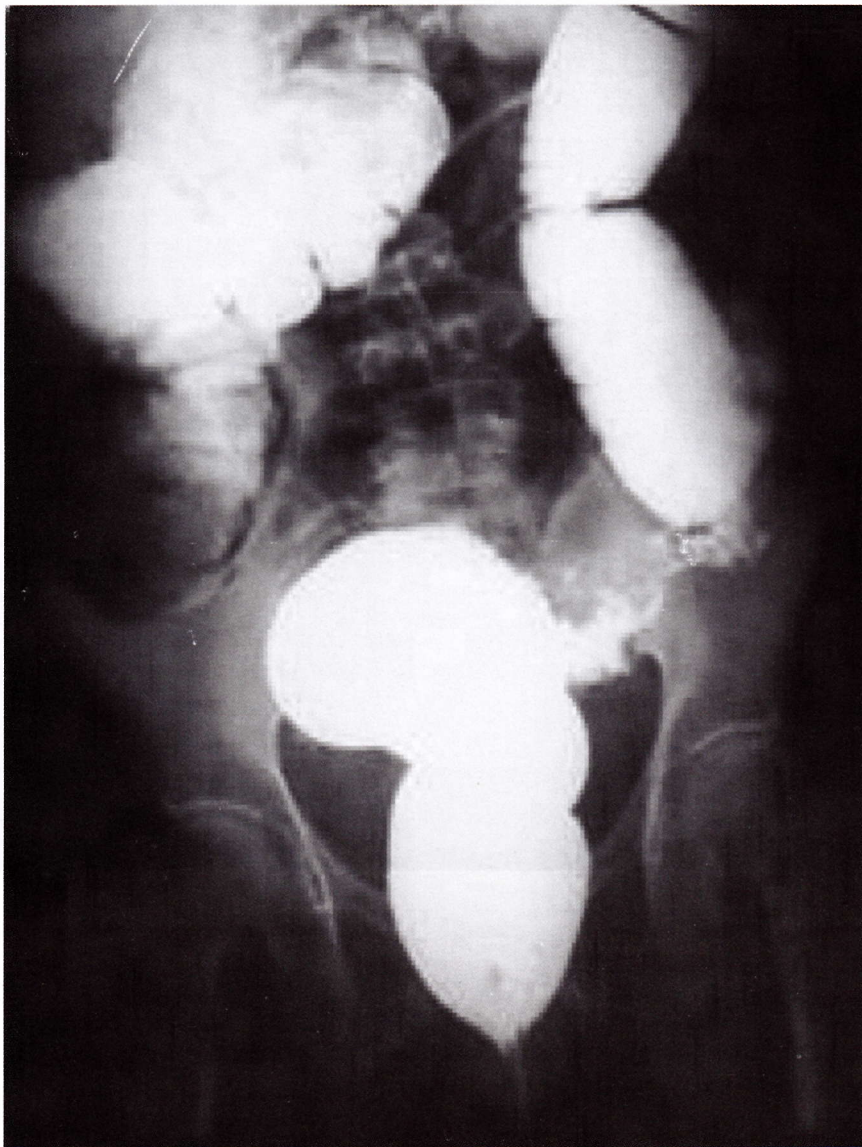
Questions

1. This condition is commonly seen in children. T
2. Patients are usually infants presented with screaming & withdrawing legs & red current jelly stools. T
3. Palpable abdominal mass can be found on clinical examination. T
4. This investigation is both diagnostic & therapeutic. T
5. This condition may be recurrent. T

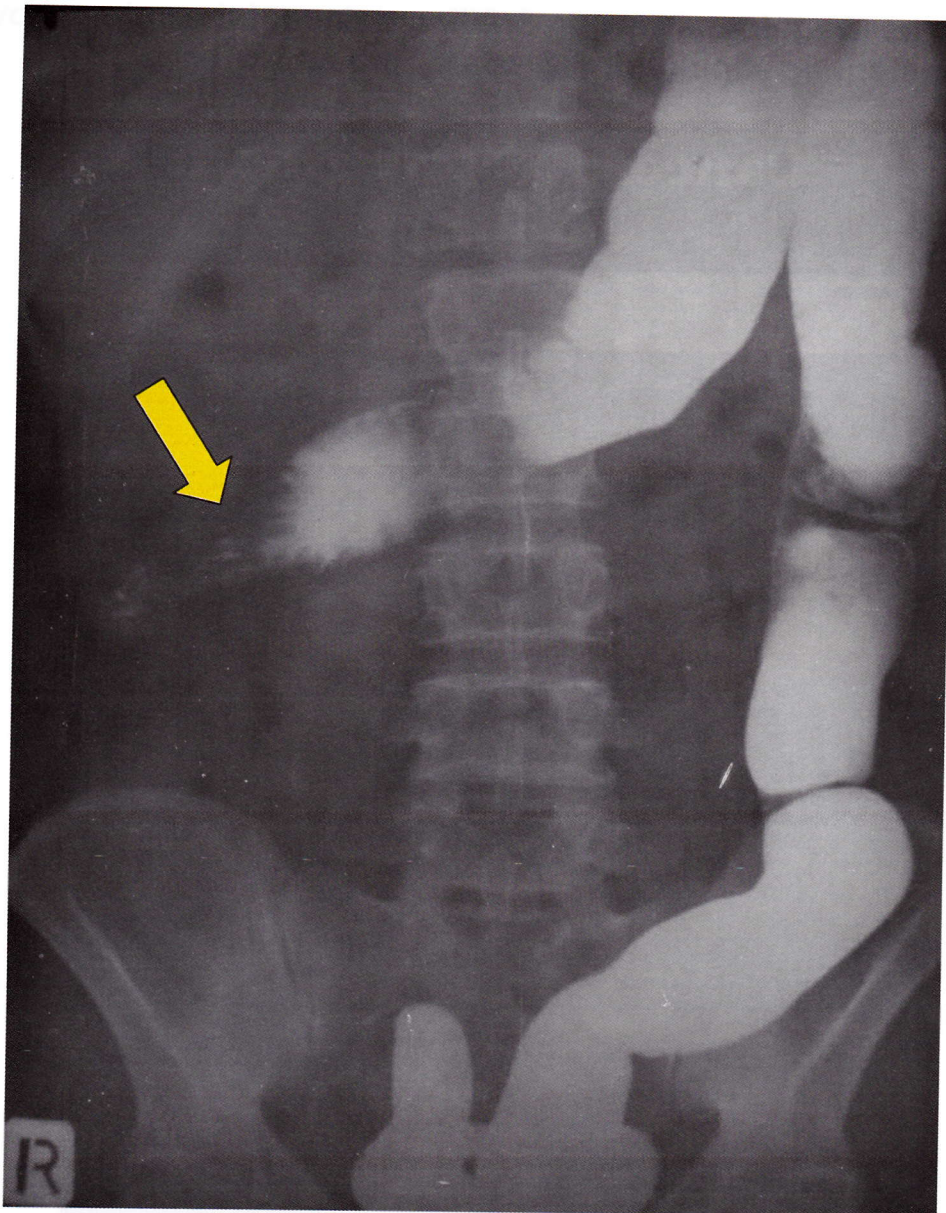
Cancer Colon

- Seen as irregular narrowing & filling defect of the colon showing characteristic shouldering & apple core appearance.

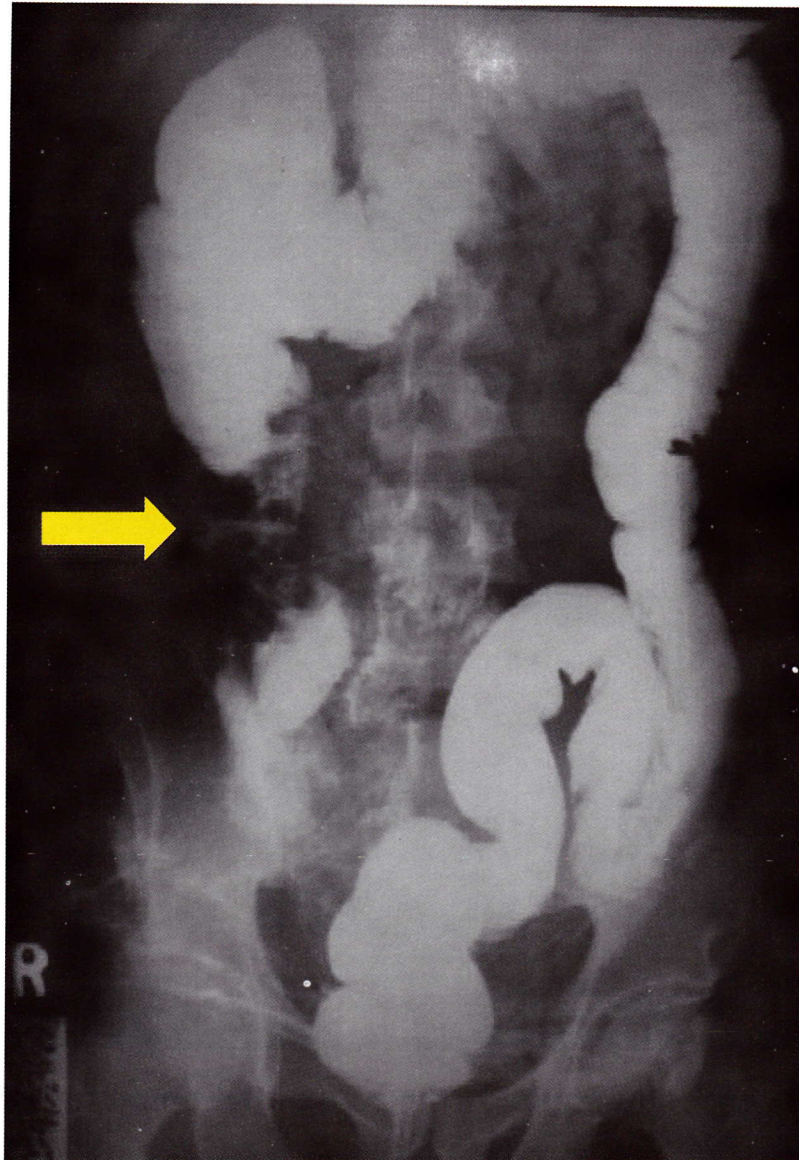
Cancer Recto-sigmoid Junction



Cancer Hepatic Flexure



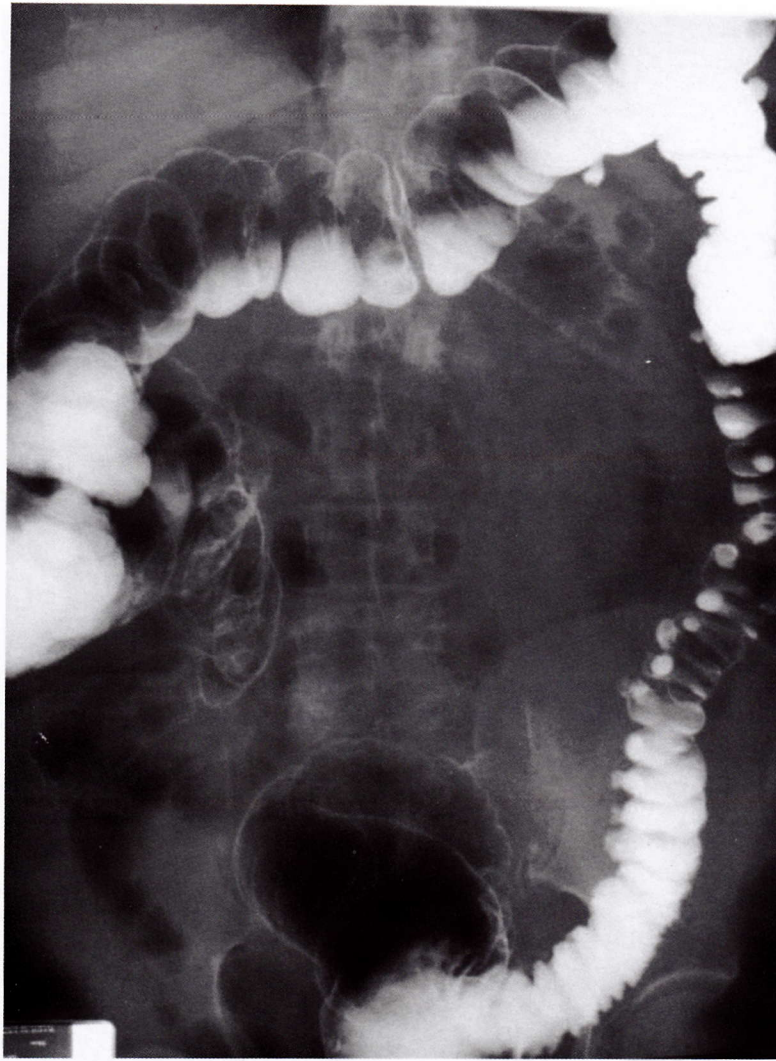
Cancer Ascending Colon



Questions

1. Patient may be presented by recent change of bowel habits. T
2. Acute intestinal obstruction may be the first presentation. T
3. Colonoscopy & biopsy is the investigation of choice. T
4. Massive bleeding per rectum is a common complication. F
5. Radical surgical treatment is possible even with hepatic metastasis. T

Diverticulosis Of The Colon



- Seen as projections outside the wall of the colon full of barium (most common in sigmoid colon).
- Saw tooth appearance may be seen.

Questions

1. The main etiology of this condition is chronic constipation. T
2. Barium enema is contraindicated in acute diverticulitis. T
3. Profuse bleeding caused by diverticulosis usually stops spontaneously. T
4. This condition is premalignant. F
5. Surgical treatment is indicated in complicated cases only. T

Familial Adenomatous Polyposis



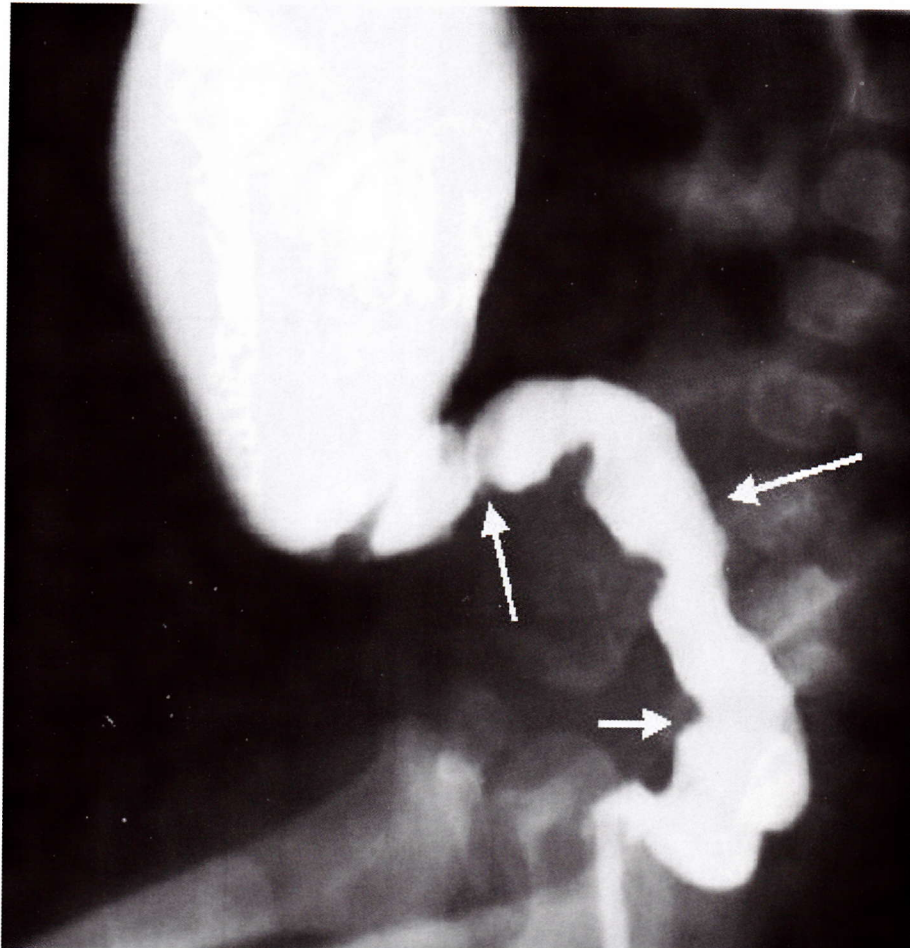
■ Seen as multiple rounded filling defects affecting the whole colon.

Questions

1. This condition is inherited as autosomal dominant trait.
2. Family screening starting from the age of 10 years is indicated.
3. This condition is 100% premalignant.
4. Colonoscopy & biopsy is the investigation of choice.
5. Surgical treatment is the only line of treatment.

T
T
T
T
T

Congenital Megacolon (Hirschsprung Disease)



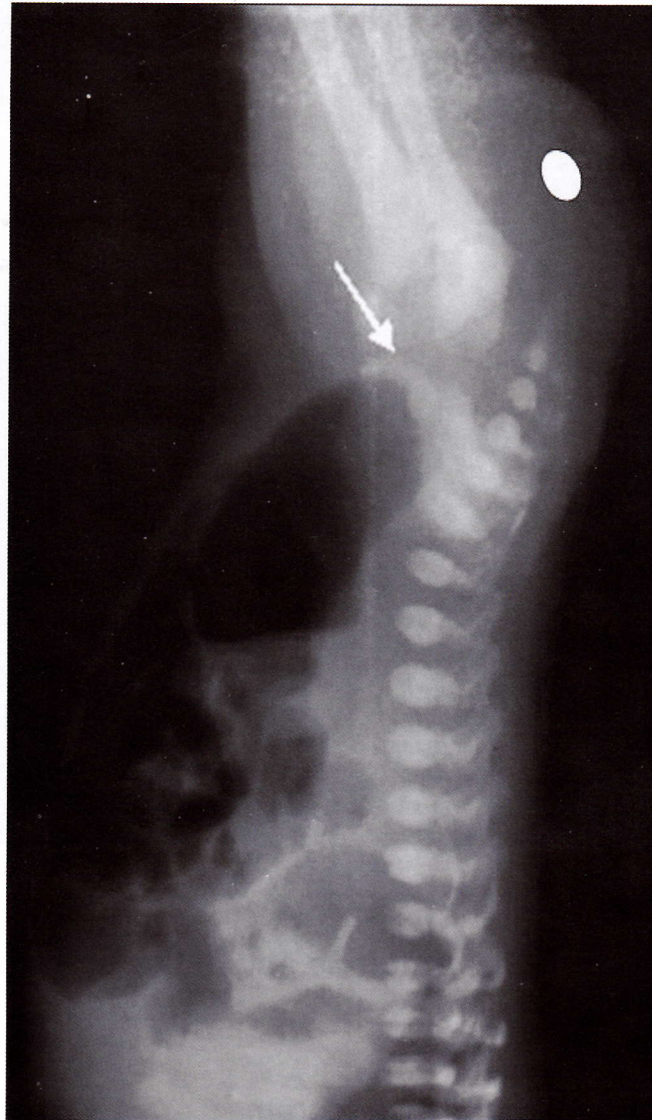
- Seen as narrow spastic aganglionic segment with dilated proximal normal segment & funneling of the transition zone inbetween the two segments.

Questions

1. Barium enema should be done for this condition without preparation & with little amount of barium. T
2. There is organic stricture of the anal canal. F
3. Abdominal distention & constipation in infancy are common presentations. T
4. Rectal mucosal biopsy is the investigation of choice. T
5. Surgical treatment is the only curative line of treatment. T

Imperforate Anus

High Anomaly



➡ **Note:**

- The gas shadow in the rectum is below the pubo-coccygeal line.

Low Anomaly



➡ **Note:**

■ The gas shadow in the rectum is above the pubo-coccygeal line.

Questions

1. This investigation is called invertogram. T
2. This investigation should be done after more than 24 hours after birth with the baby inverted upside down & flexed thighs with lateral imaging. T
3. Abdominal distention is present in such condition. T
4. It may be associated with other congenital anomalies. T
5. Colostomy is the only line of treatment. F

Ulcerative Colitis



Barium enema

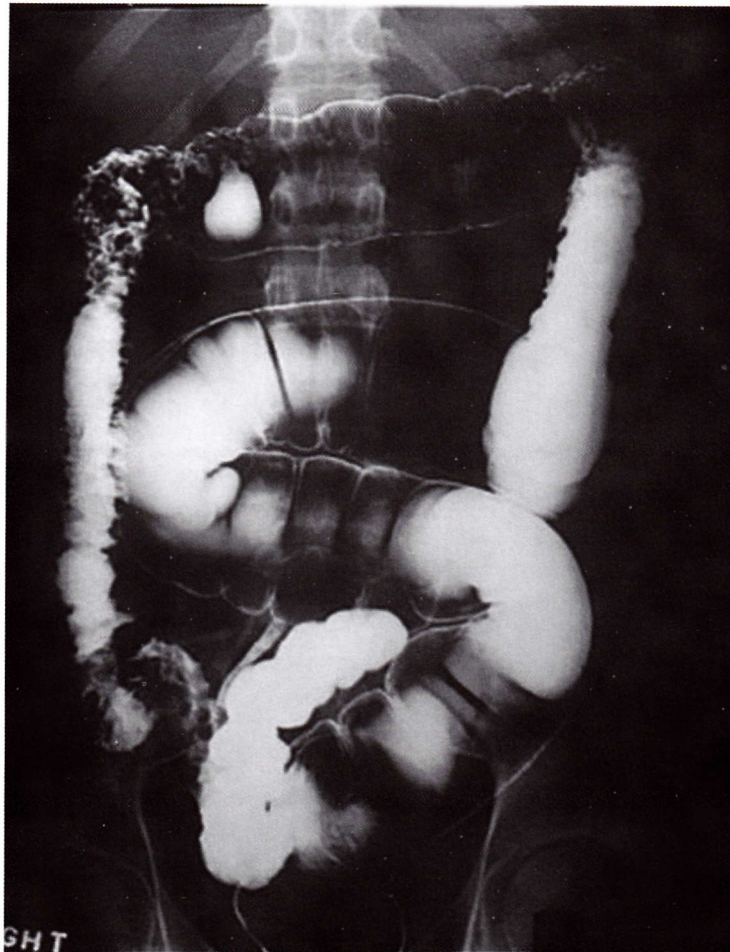
► Note:

- Showing loss of haustrations, short & narrow colon causing pipe steam appearance.
- Filling defects caused by wide spread ulcers & filling excesses caused by mucosal regeneration give ground glass appearance.
- Affection of the rectum with or without variable segments of colon with no skip lesions is characteristic for ulcerative colitis.

Questions

1. Diarrhea, blood & mucous per rectum are common clinical presentations for this condition. T
2. Tender palpable colon & weight loss are common features for this condition. T
3. Stool analysis can confirm the diagnosis. F
4. Colonoscopy can confirm the diagnosis. T
5. Medical treatment is the main line of treatment. T

Crohn's Disease



Barium follow through

➔ **Note:**

- Showing narrowing of the terminal ileum with nodular mucosal pattern.
- Extensive narrowing with associated deep ulceration is seen in the caecum & ascending colon.

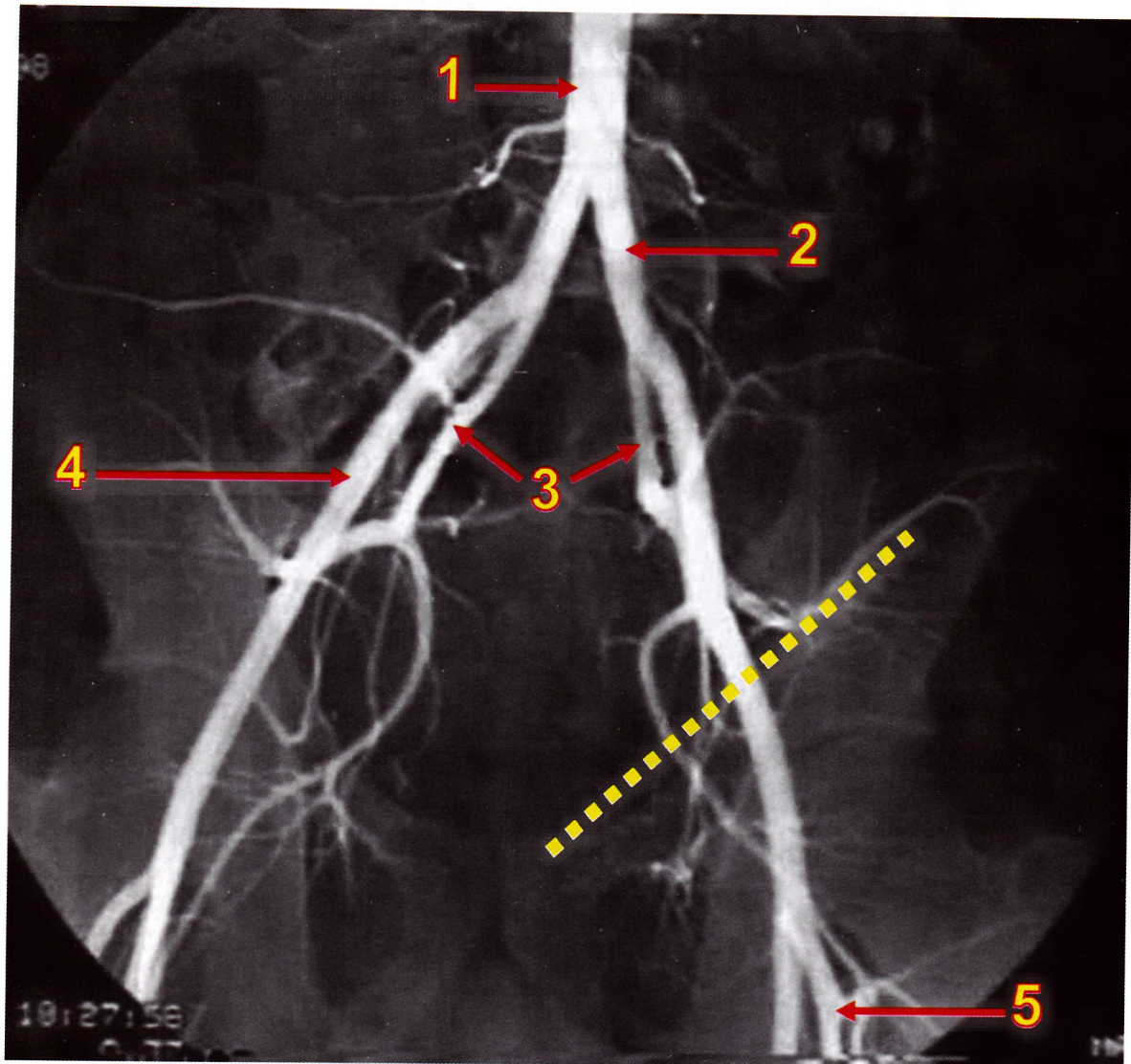
Questions

1. This condition may be due to autoimmune disorder. T
2. Malabsorption & weight loss are the main presentations for this condition. T
3. Massive bleeding per rectum is a possible complication. F
4. Intestinal obstruction & fistula formation are common complications for this condition. T
5. Medical treatment is the first step in management of this condition. T

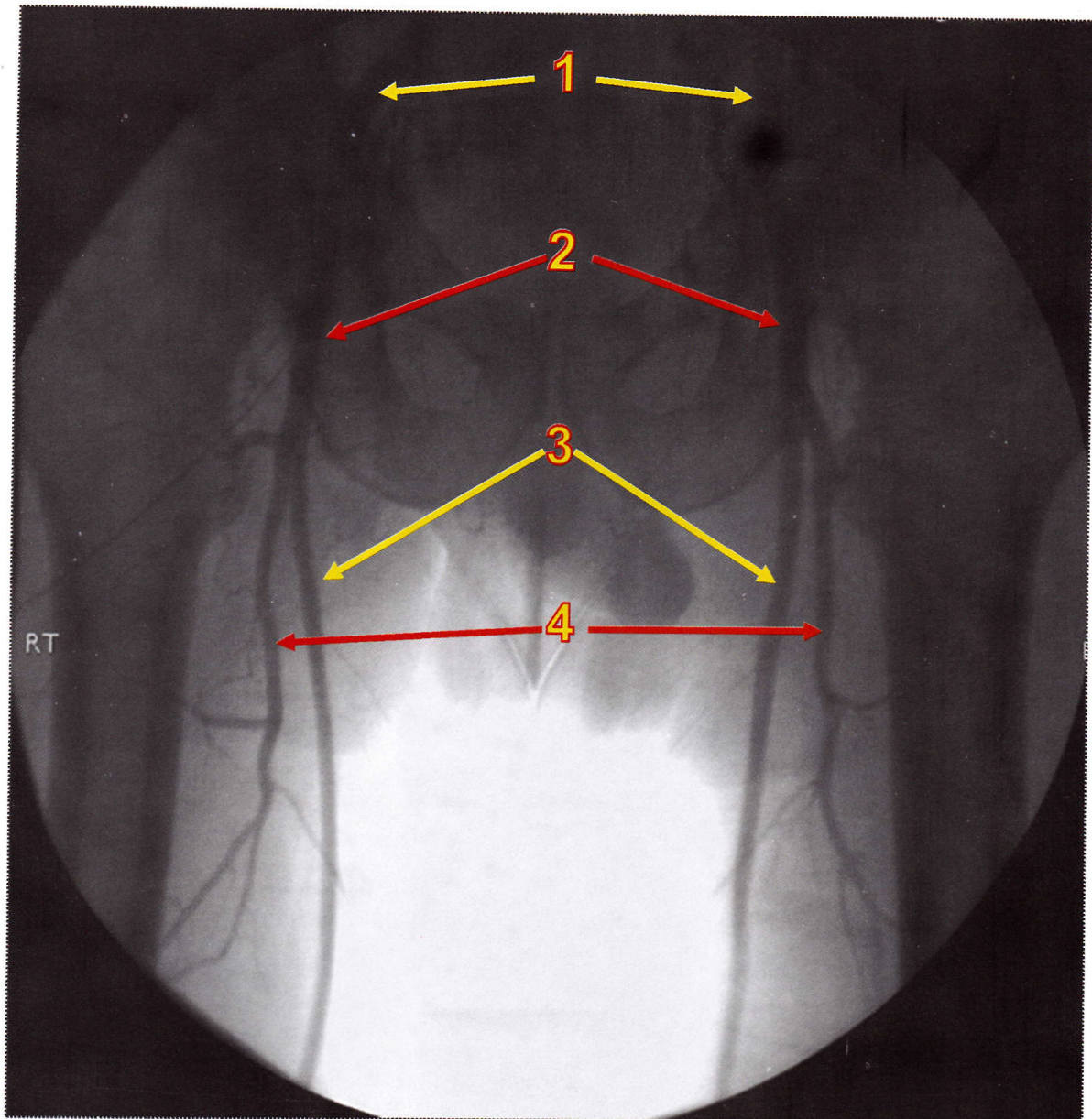
-6-

Vascular Radiology

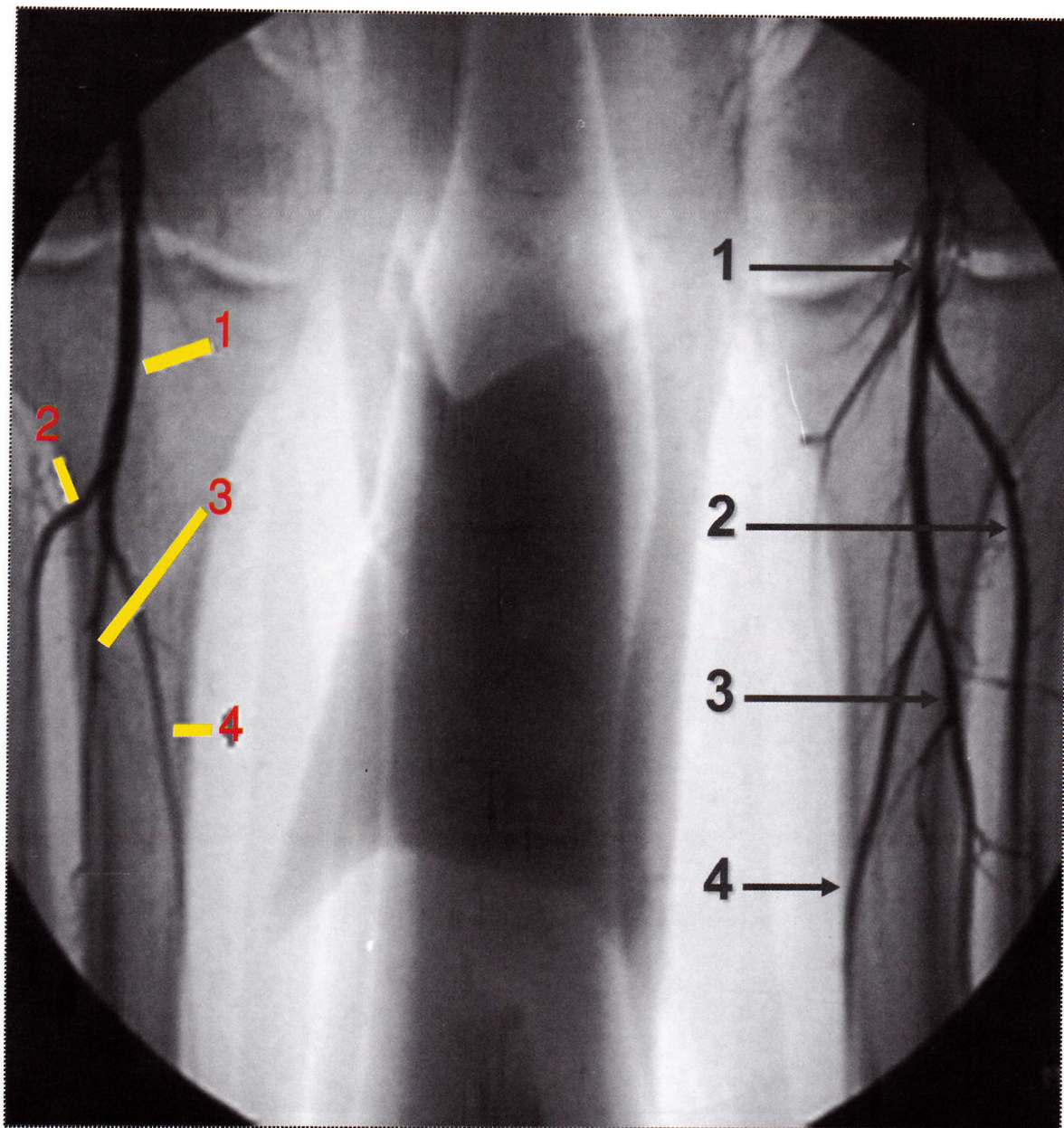
Normal Angiography



1. Lower abdominal aorta
2. Common iliac A.
3. Internal iliac A.
4. External iliac A.
5. Deep femoral a.



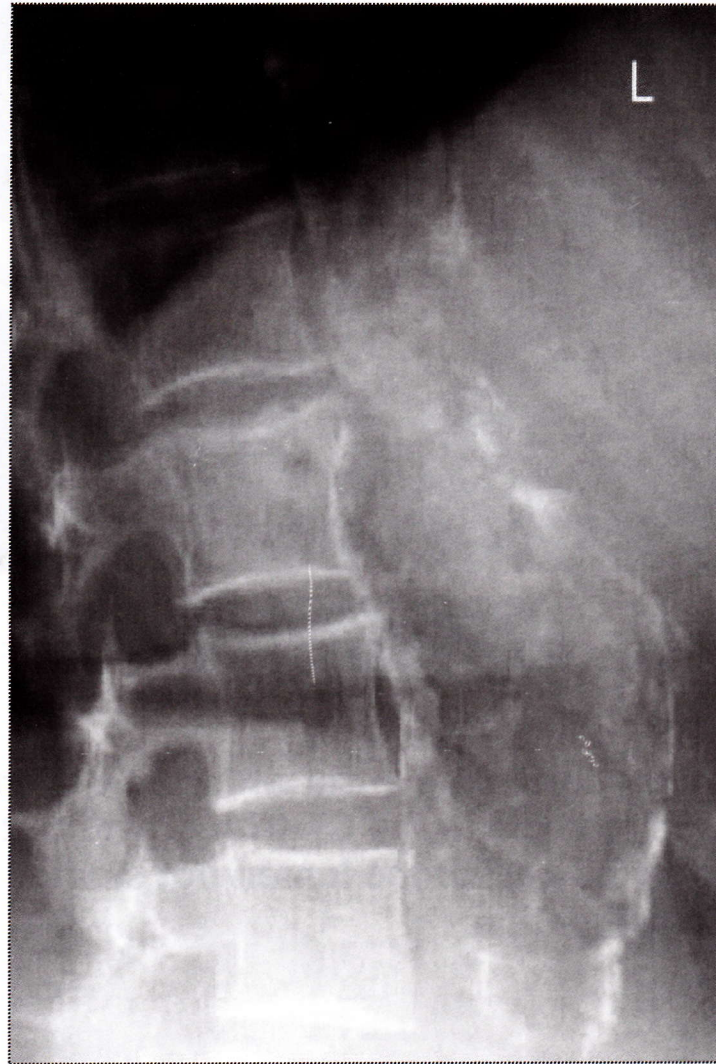
1. External iliac A.
2. Common femoral A.
3. Superficial femoral A.
4. Deep femoral A.



- 1. Popliteal A.
- 2. Anterior tibial A.
- 3. Peroneal A.
- 4. Posterior tibial A.

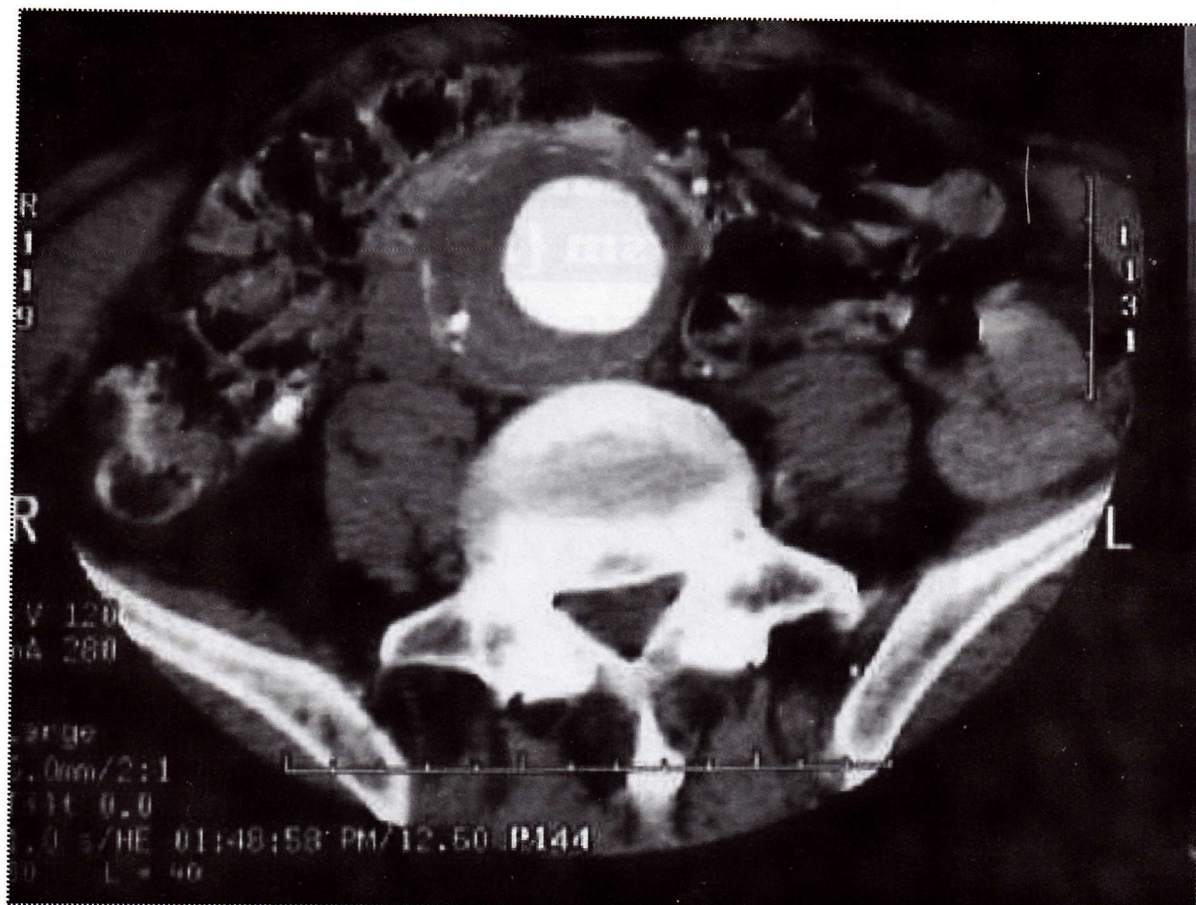
Aneurysms

Abdominal Aortic Aneurysm {AAA}



Plain x-ray

- Seen as calcification in the wall of aorta in front of the vertebrae.



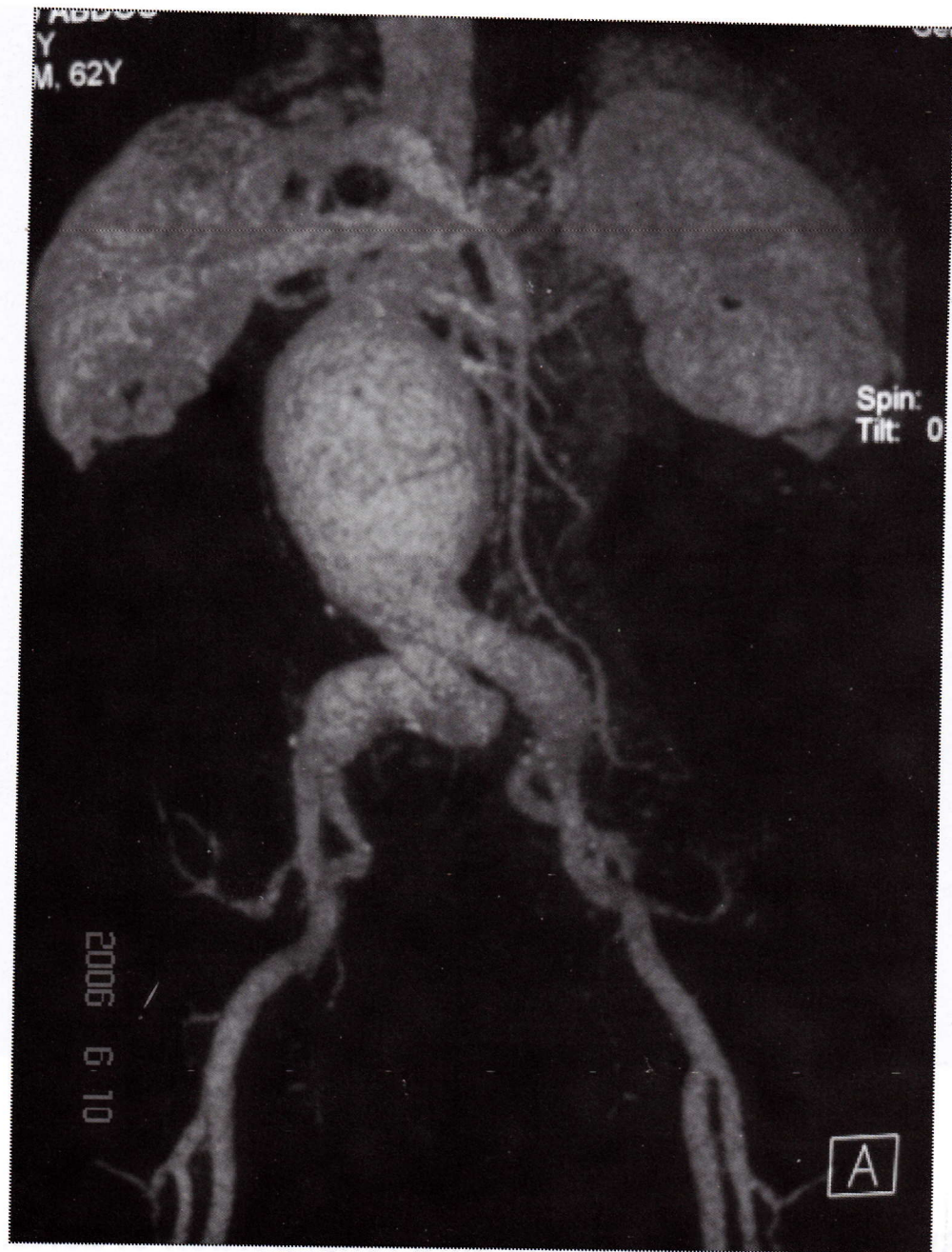
CT scan

- Seen as dilatation in the aorta which can be measured in comparison to scale in the CT with or without mural thrombosis (the part of the lumen not stained with dye) and wall calcification.



Angiography

- Showing dilatation of the infra-renal portion of aorta.



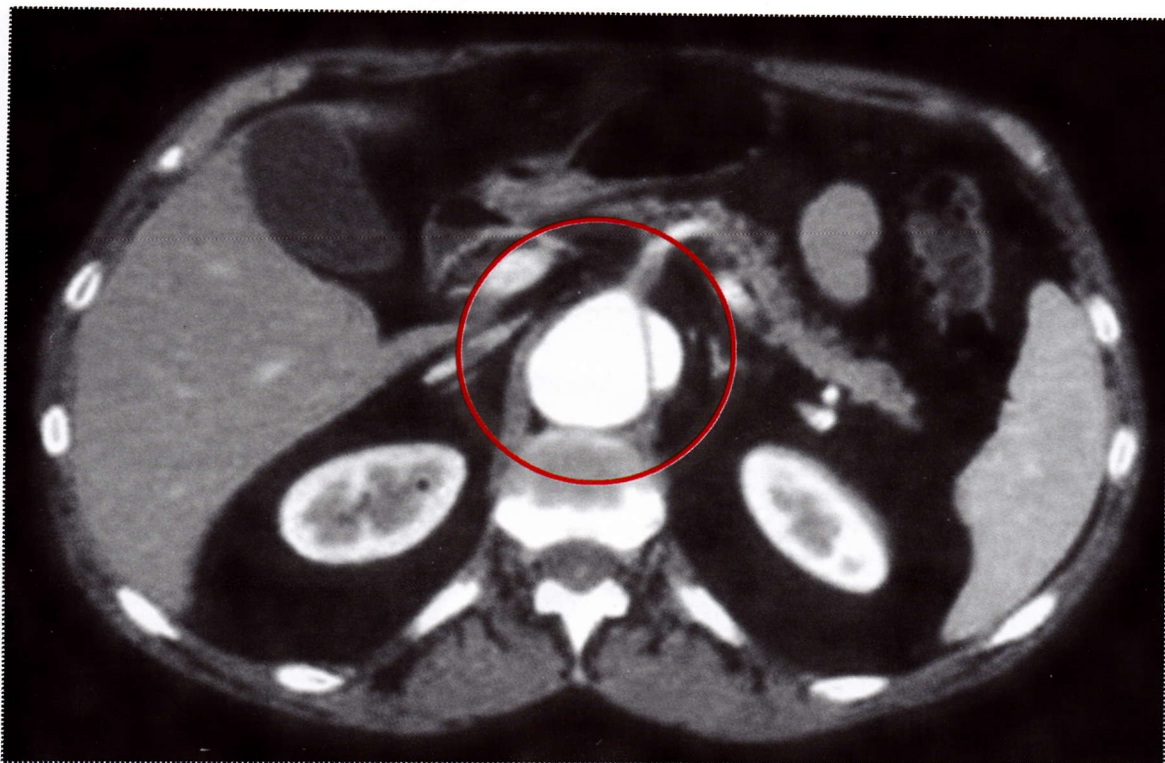
CT angiography

- Showing dilatation of the infra-renal portion of aorta and both iliac arteries.



CT scan of leaking
aortic aneurysm

- Seen as leak of dye outside the aorta in the retro-peritoneal space.



CT scan of aortic dissection

■ **Seen as splitting of the lumen of aorta (double lumen) with or without mural thrombosis.**

Questions

1. The most common cause of AAA is atherosclerosis. T
2. AAA may be presented with backpain & pulsating abdominal mass. T
3. U/S is the investigation of choice for screening for AAA. T
4. Angiography is the best investigation to determine the true diameter of AAA. F
5. AAA more than 4 cm should be treated conservatively. F
6. AAA can be treated by synthetic exclusion graft. T

Popliteal artery aneurysm angiography



Questions

1. Screening investigation for popliteal artery aneurysm is angiography. **F**
2. Popliteal artery aneurysm rupture is a common complication. **T**
3. Surgical treatment of popliteal artery aneurysm is indicated to avoid distal embolization. **T**



Saccular aneurysm

Questions

1. This condition may be a complication of trauma.
2. Conservative treatment is a line of treatment.
3. Follow up of this aneurysm will show gradual increase in size then rupture.

T
F
T

Ischemia

A. Chronic ischemia

**Leriche syndrome
(infra-renal aorto-iliac
disease)**

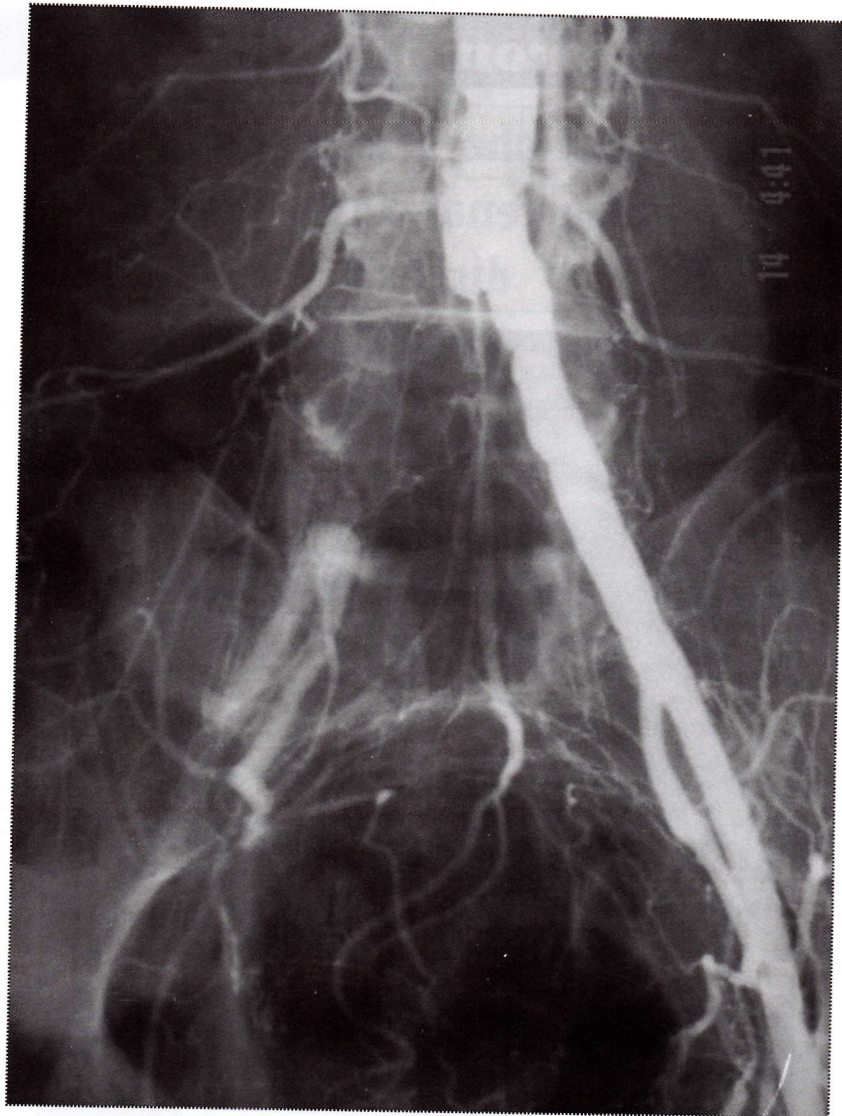


- Seen as stenosis or occlusion of infra-renal portion of aorta together with iliac arteries on both sides with collaterals appearing around the occluded arteries indicating chronic ischemia.

Questions

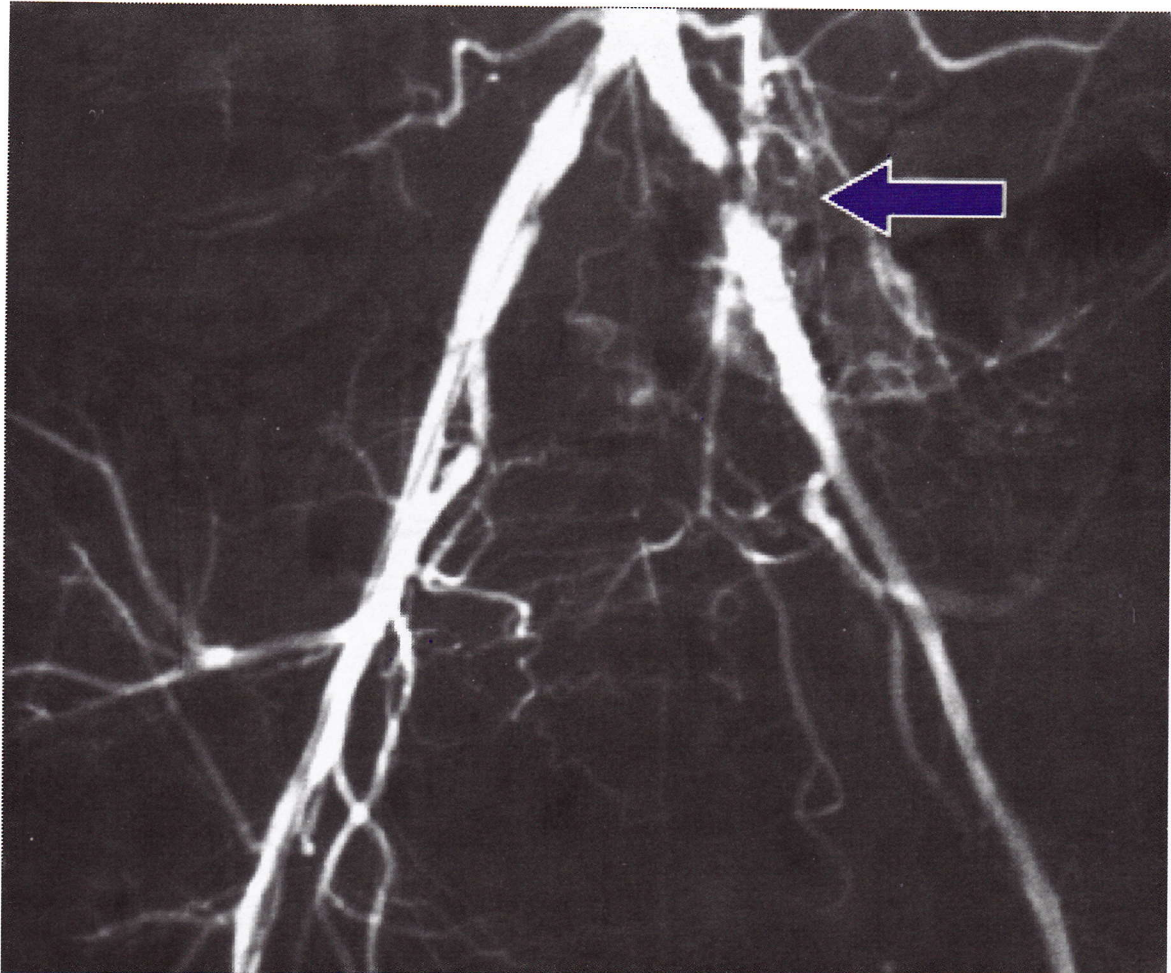
1. This imaging technique is digital subtraction angiography. T
2. Patients present with claudication pain in buttocks & thighs. T
3. Examination of this patient will reveal absent femoral pulses on both sides. T

Iliac artery disease



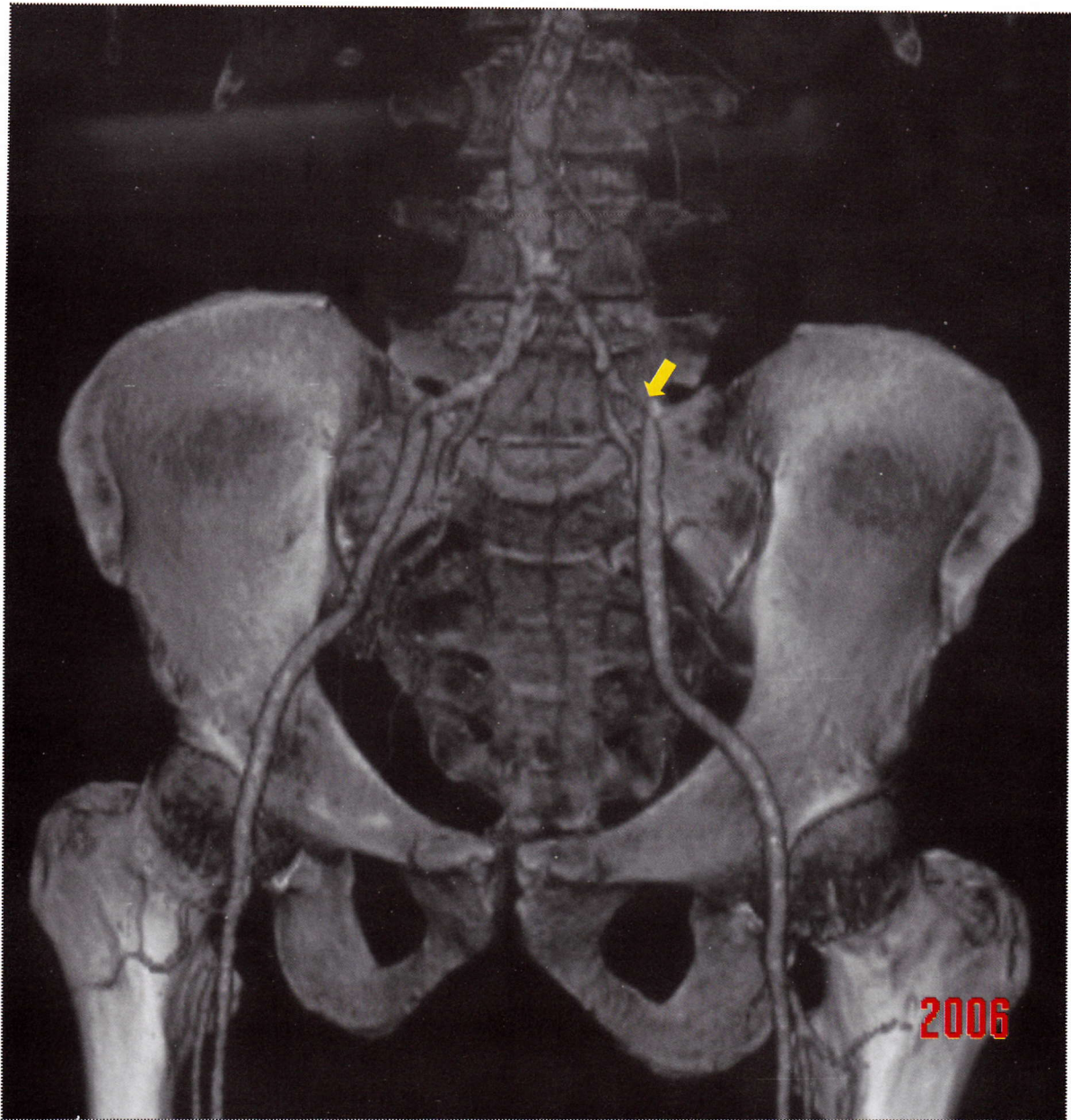
Angiography

- Seen as stenosis or occlusion of the iliac artery with collaterals appearing around the occluded artery indicating chronic ischemia.

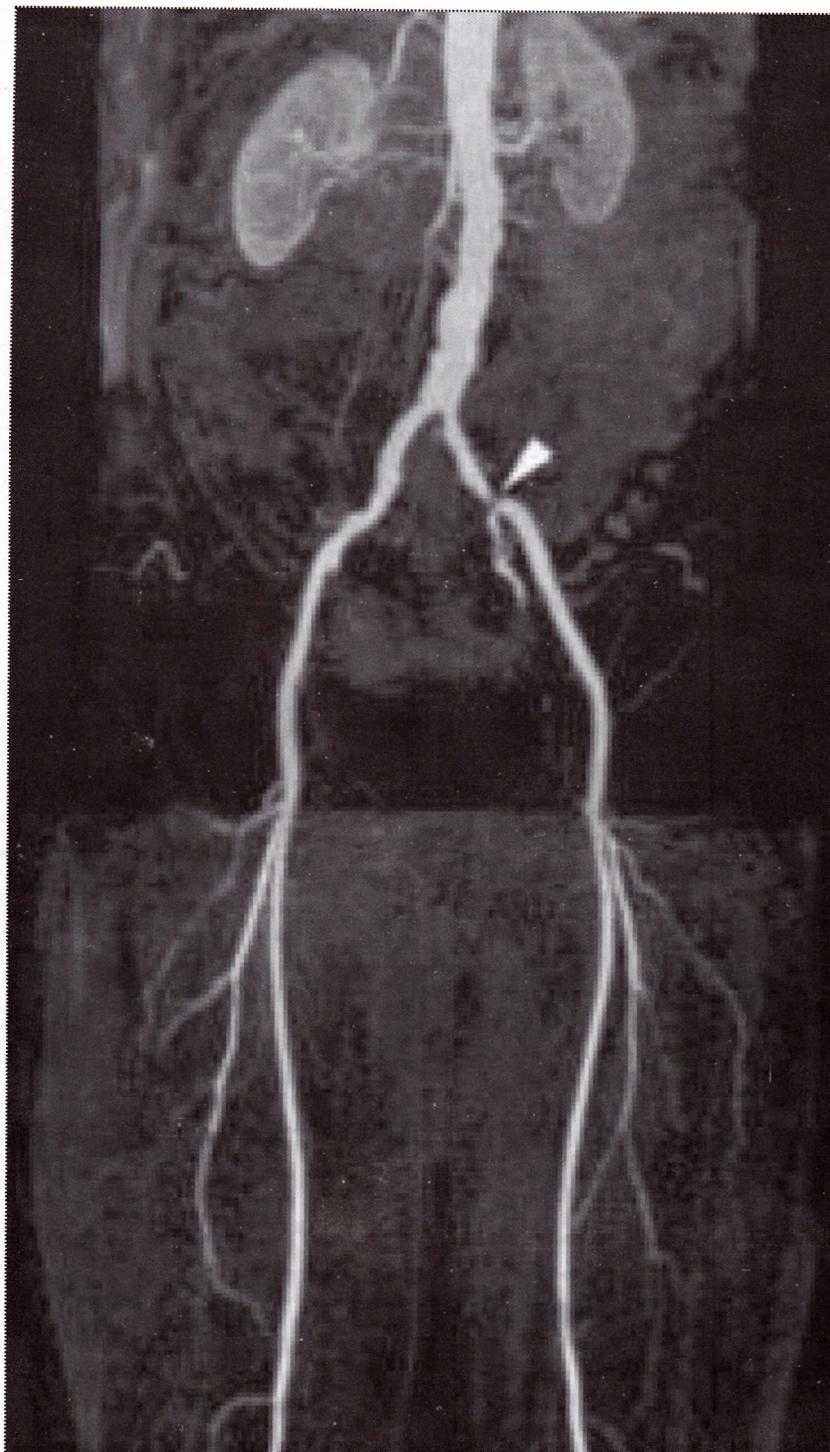


Digital subtraction angiography

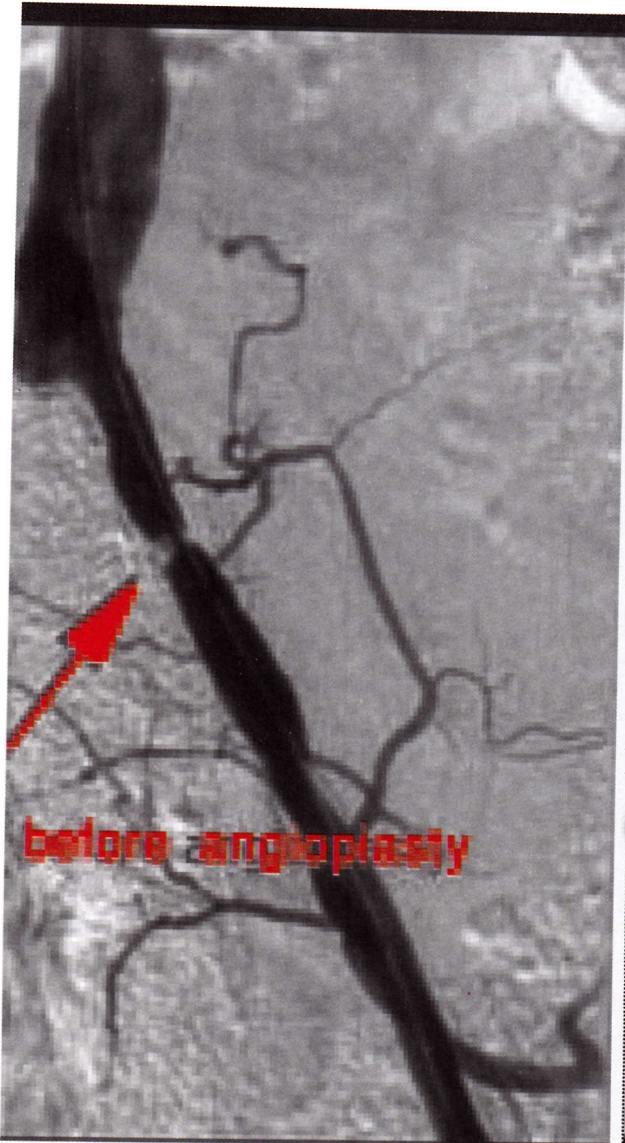
notarization of the yigayighe T3



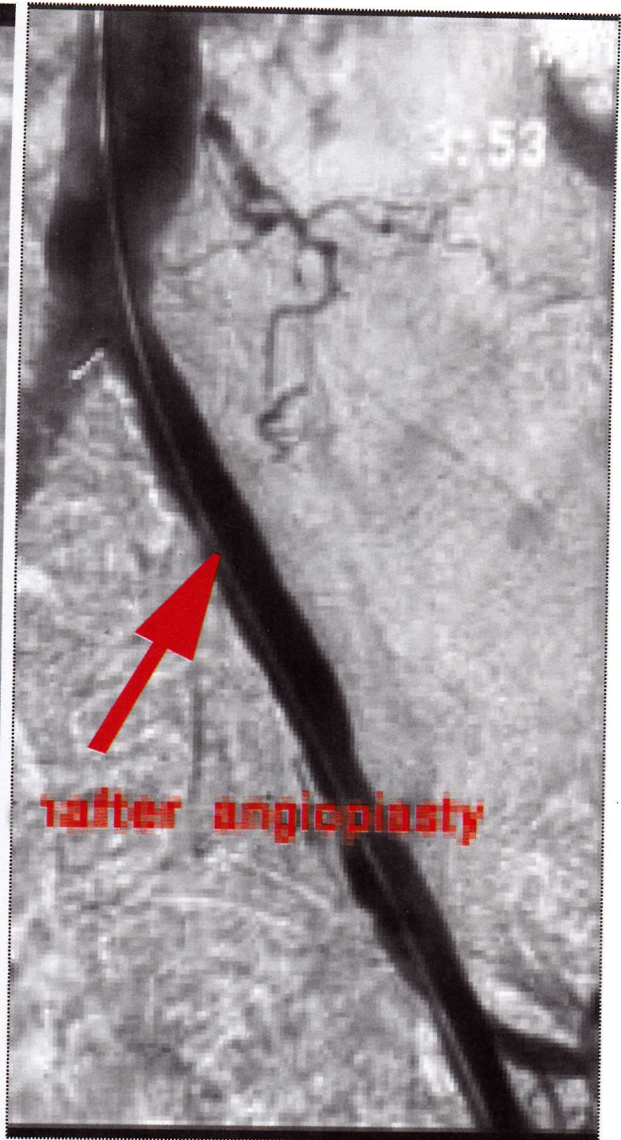
CT angiography with 3D reconstruction



Magnetic Resonance Imaging MRA

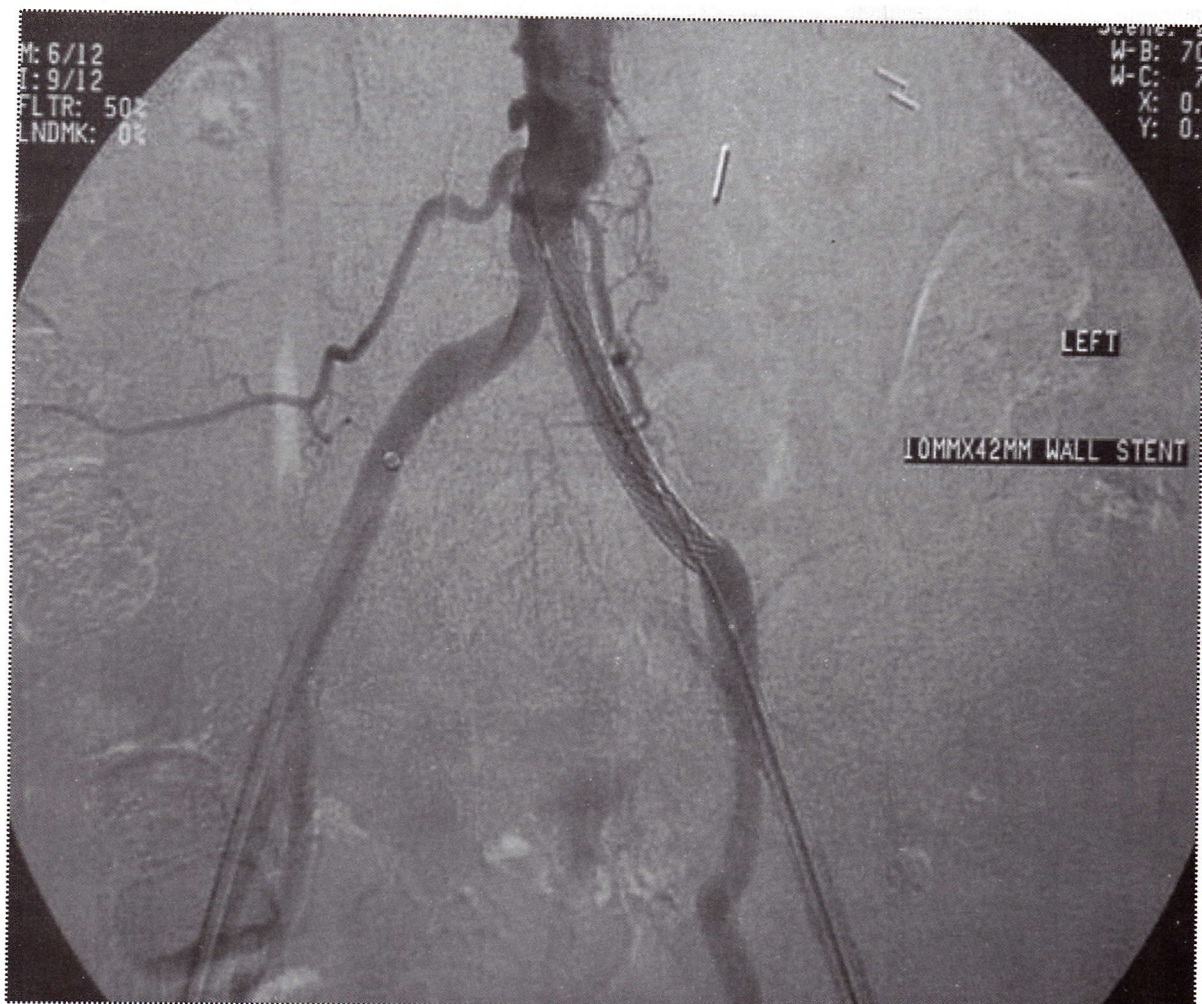


Before dilatation

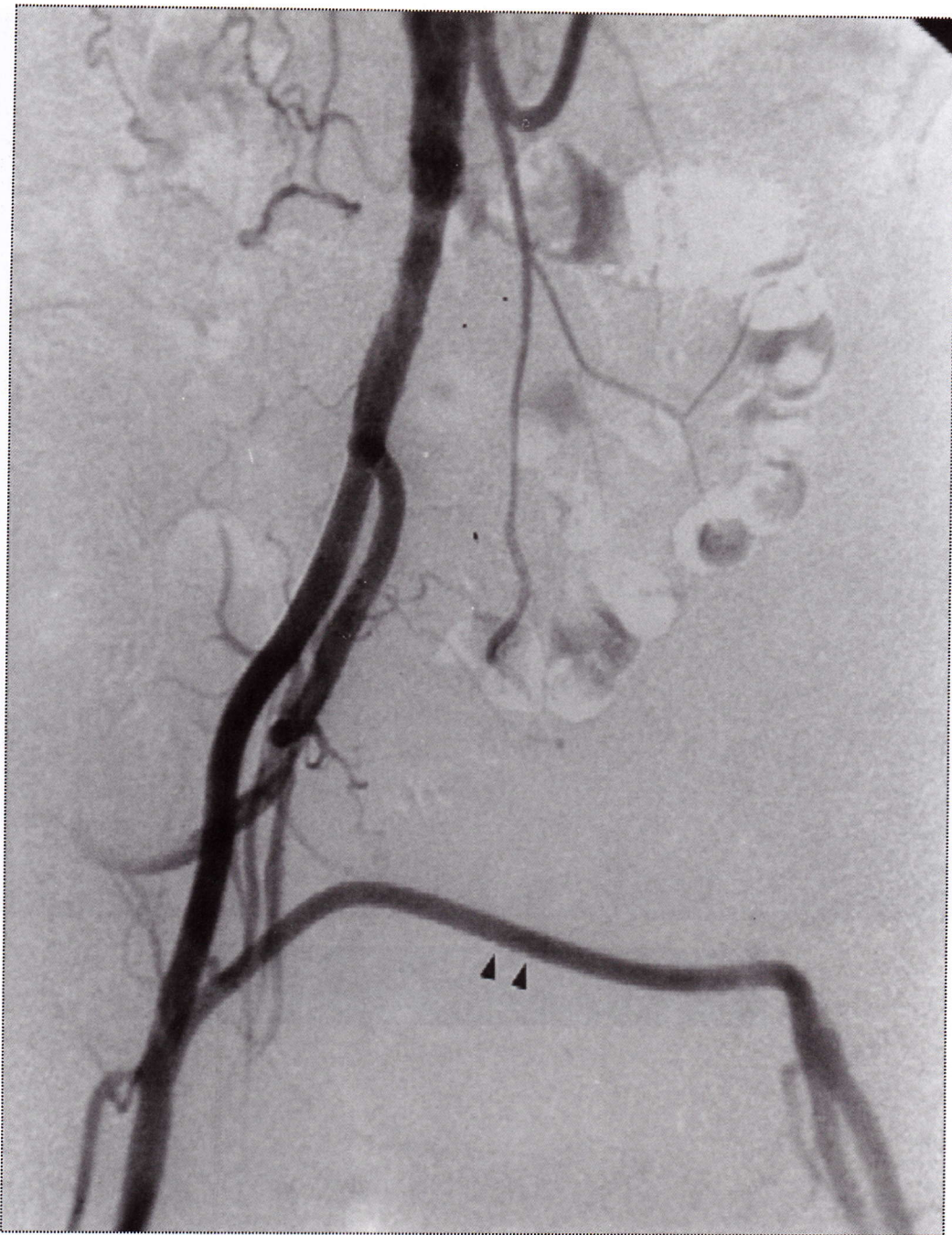


After dilatation

Balloon dilatation



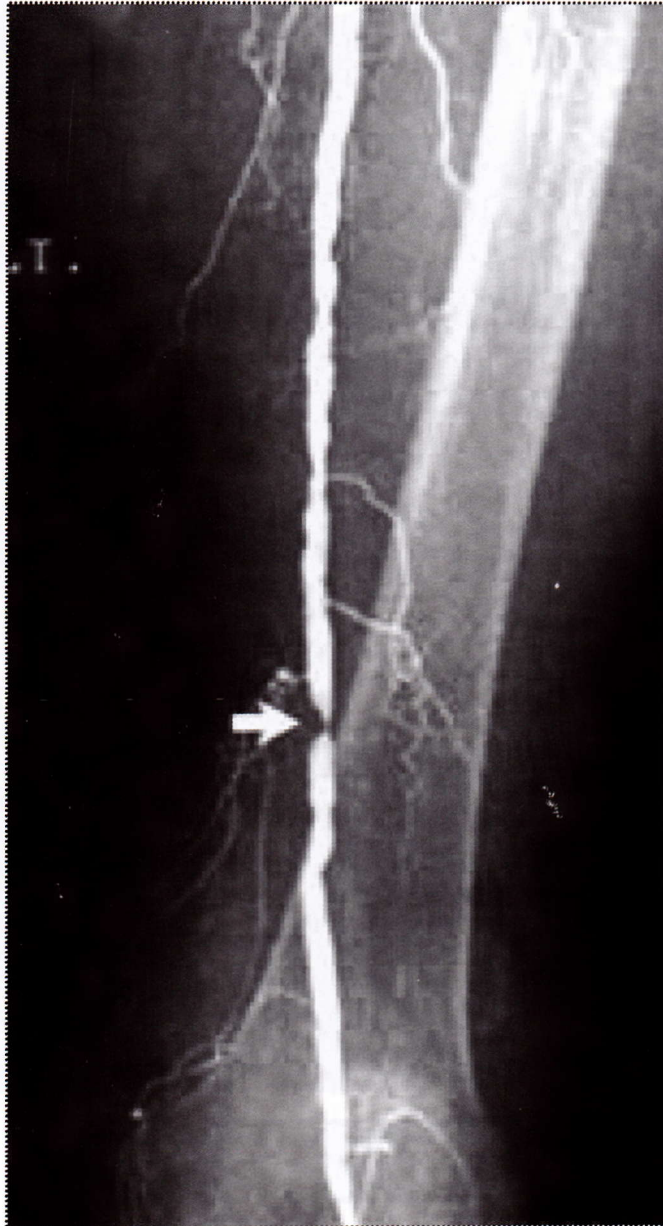
Balloon dilatation with stent



**Extra-anatomical bypass (femoro-femoral bypass)
→ for treatment of left iliac occlusion**

Femoro-popliteal Disease

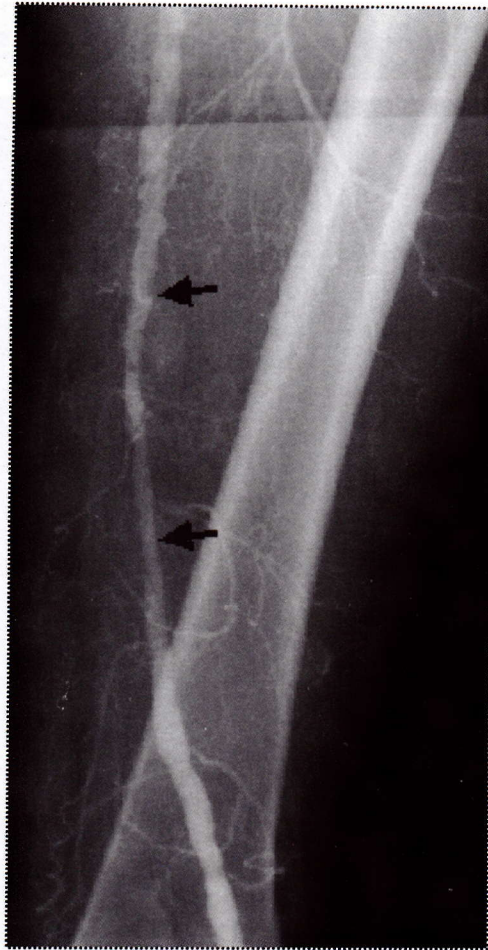
- Seen as stenosis or occlusion of the femoral or popliteal arteries with collaterals appearing around the occluded artery indicating chronic ischemia.



Short segment stenosis



Long segment stenosis

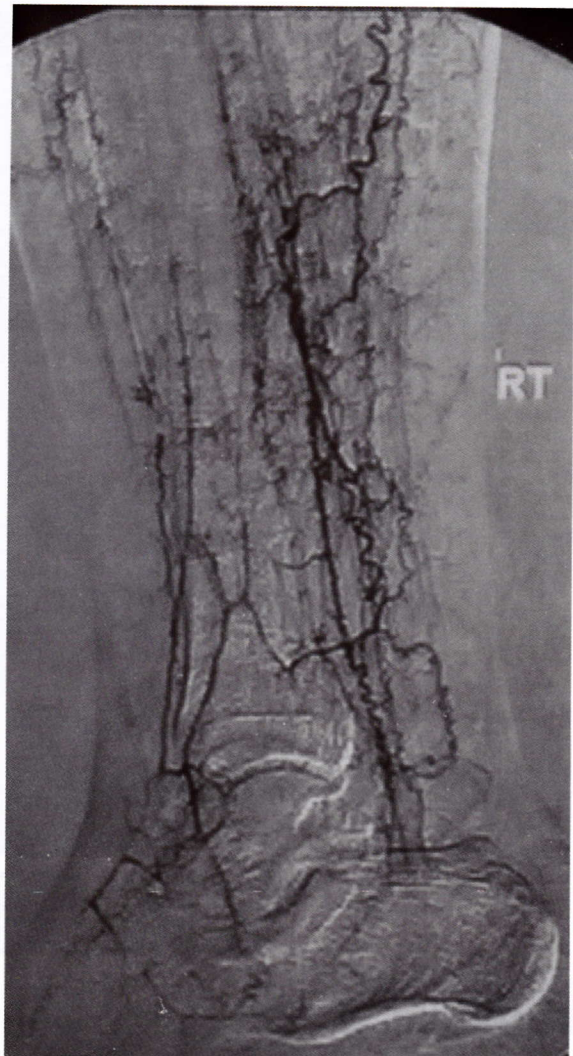
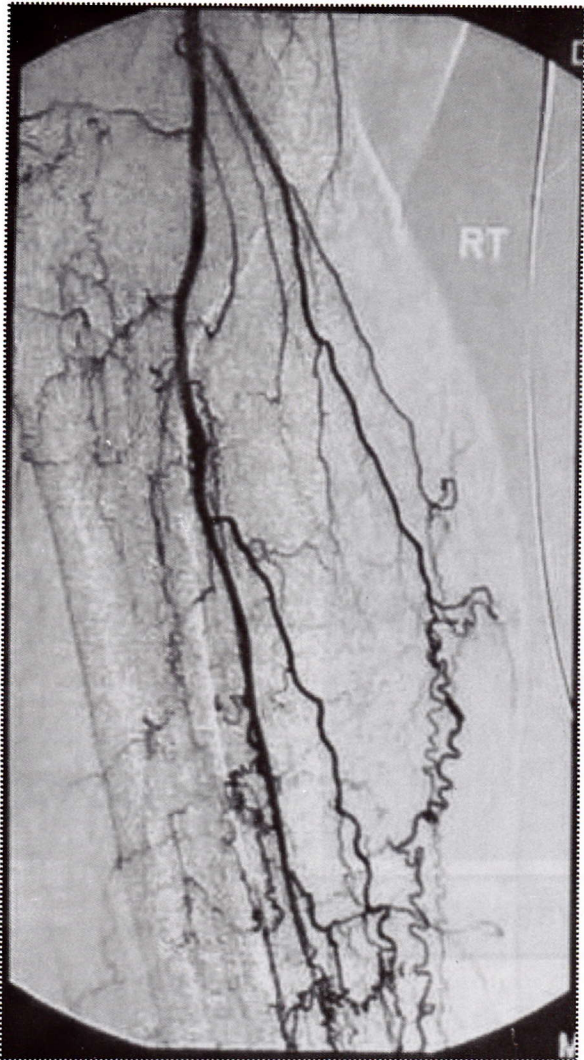


Treatment by vascular graft

Questions

1. Atherosclerosis is the most common cause of femoral artery stenosis. T
2. CT angiography is more accurate than conventional angiography. F
3. CT angiography can be used in patients with borderline renal functions. F
4. Checking the run-off is essential before deciding the treatment modality. T
5. Balloon angioplasty is the treatment of choice in short segment stenosis of a big artery. T
6. Extra-anatomical bypass is used in high risk patients unable to tolerate surgery. T
7. Saphenous vein is preferred over synthetic grafts for treatment of long segment stenosis of the femoral artery. T

Infra-popliteal disease



- **Burger's disease seen as diseased arteries below the knee with corkscrew collaterals down to the foot with no refilling (no run-off).**

Questions

1. This disease is inflammatory disease involving neuro-vascular bundle. T
2. Smoking is a predisposing factor for this disease. T
3. Arterial bypass is a line of treatment for this disease. F



- **Infra-popliteal atherosclerosis seen as stenosis or occlusion of one or more of tibial arteries with collaterals appearing around the occluded artery indicating chronic ischemia with or without refilling (run-off) in distal arteries.**

Questions

1. This condition is common in diabetic patients. **T**
2. Patients usually present with calf claudication pain. **F**
3. Arterial bypass is a line of treatment if there is distal run-off. **T**

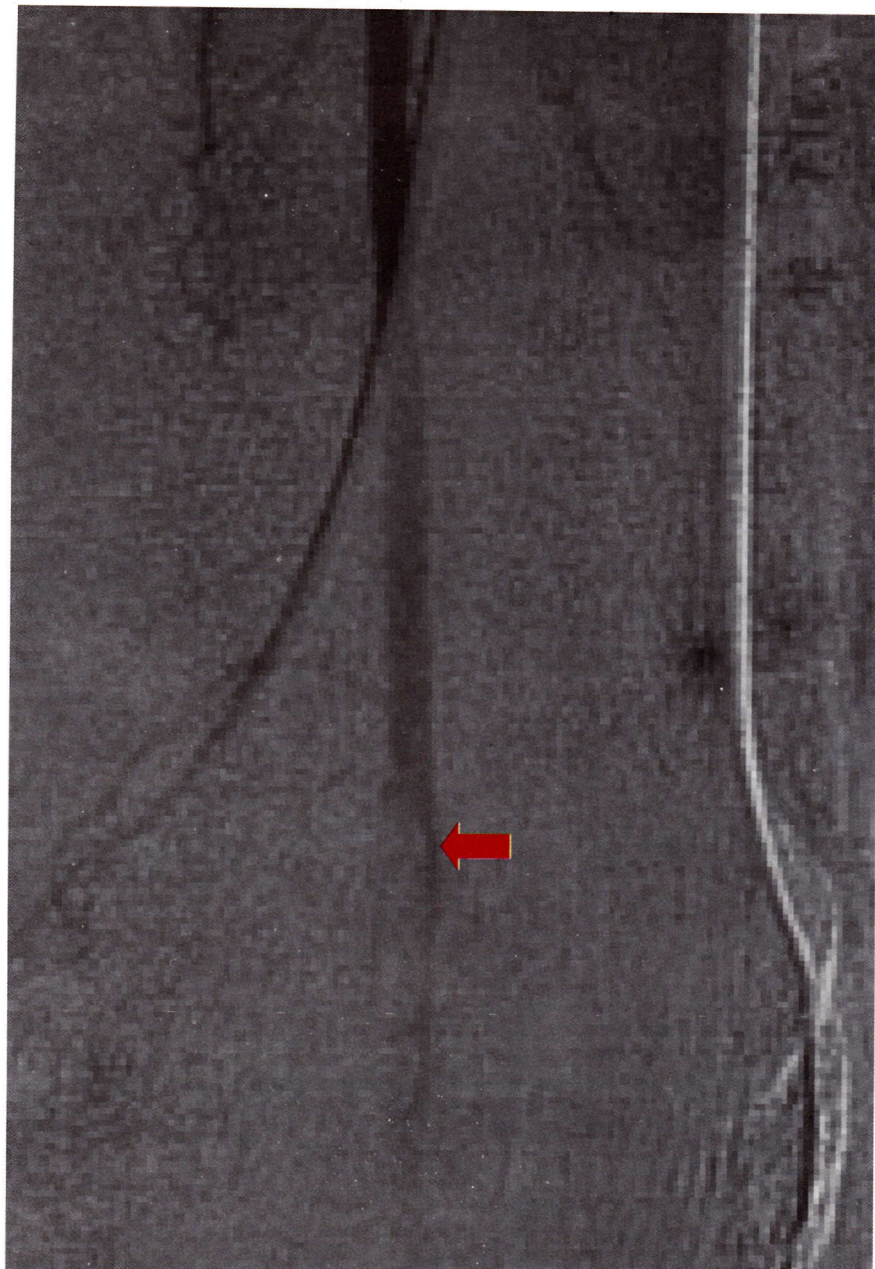
B. Acute ischemia

- To identify presence of acute ischemia, there must be associating history suggestive of acute ischemia.

Acute embolism

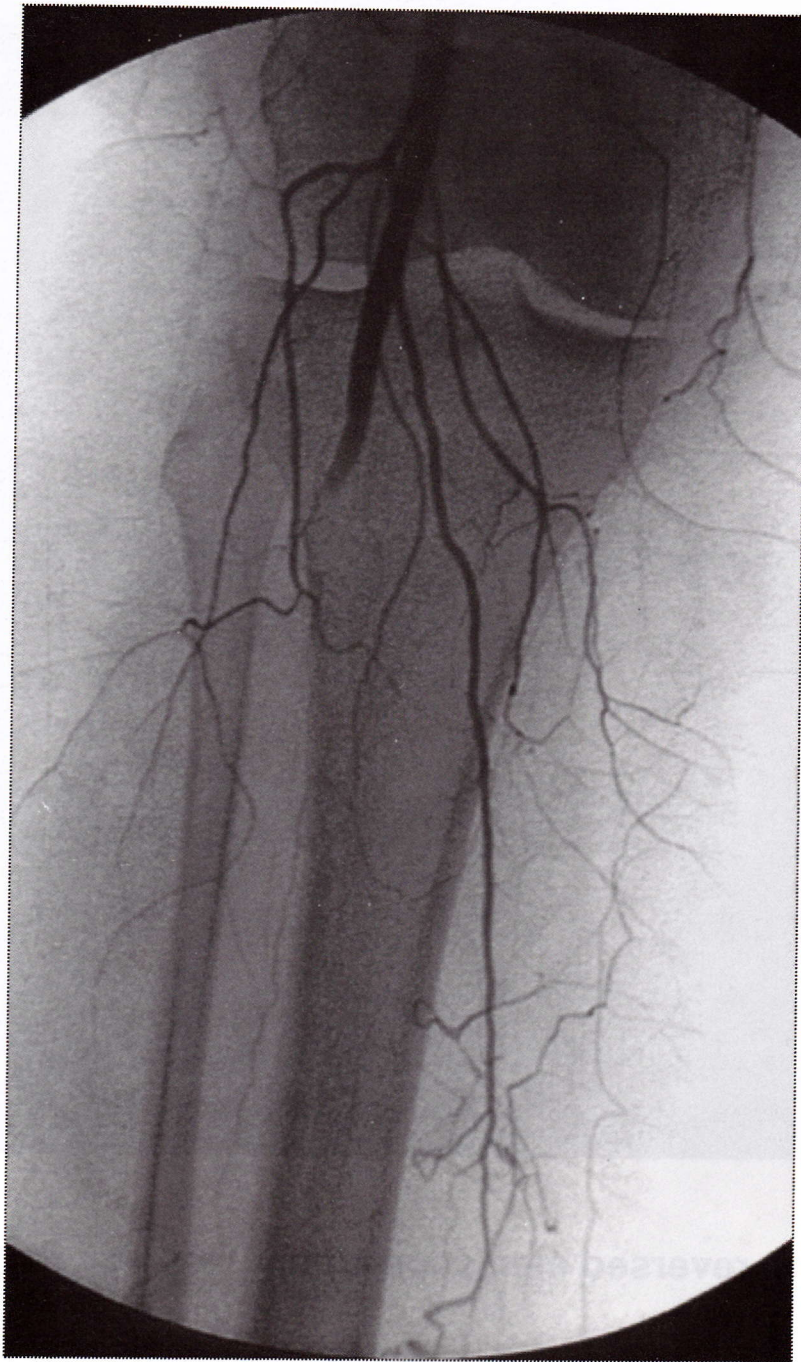


- Seen as healthy arterial tree with clot silhouette
- Which looks like filling defect in the artery



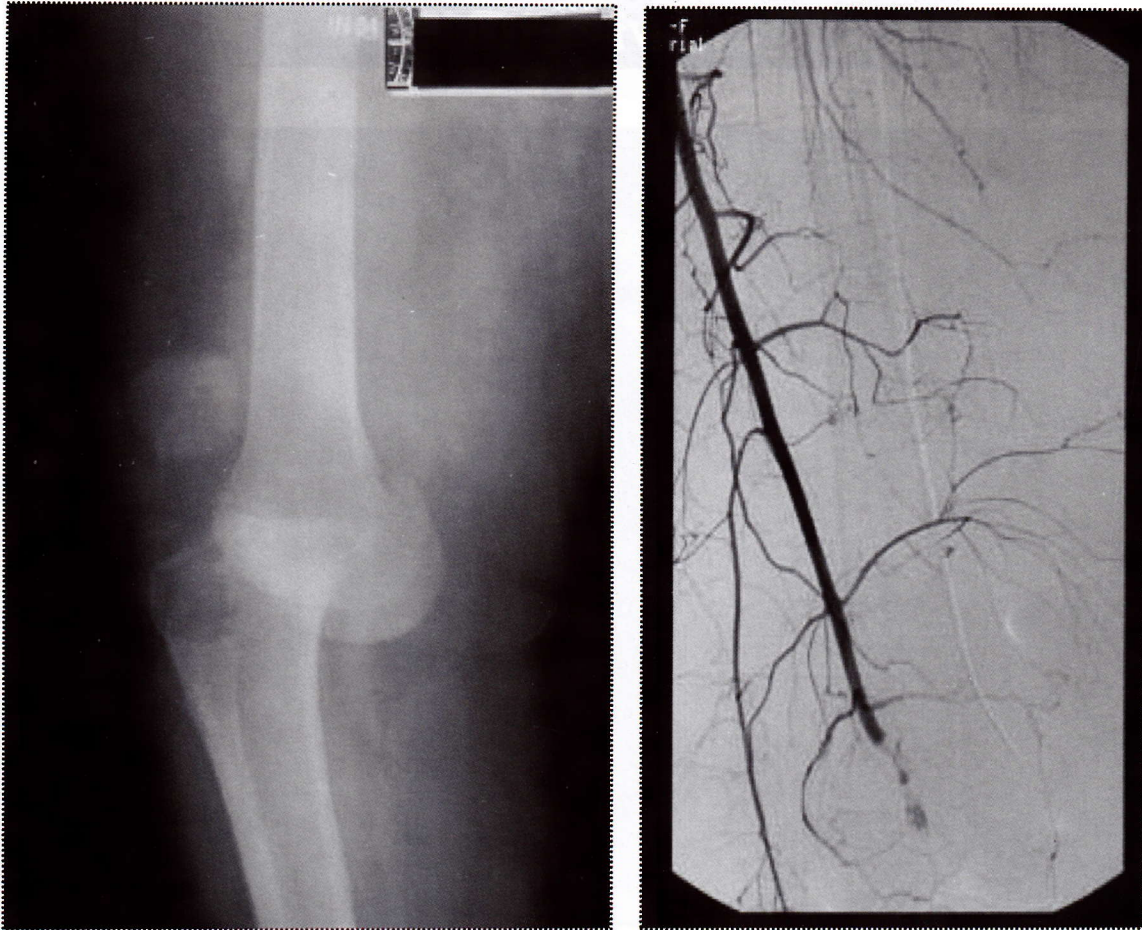
■ Or with reversed meniscus sign.

Acute thrombosis



- Seen as obstruction of an artery with well developed collaterals around the artery.

Post-traumatic Ischemia



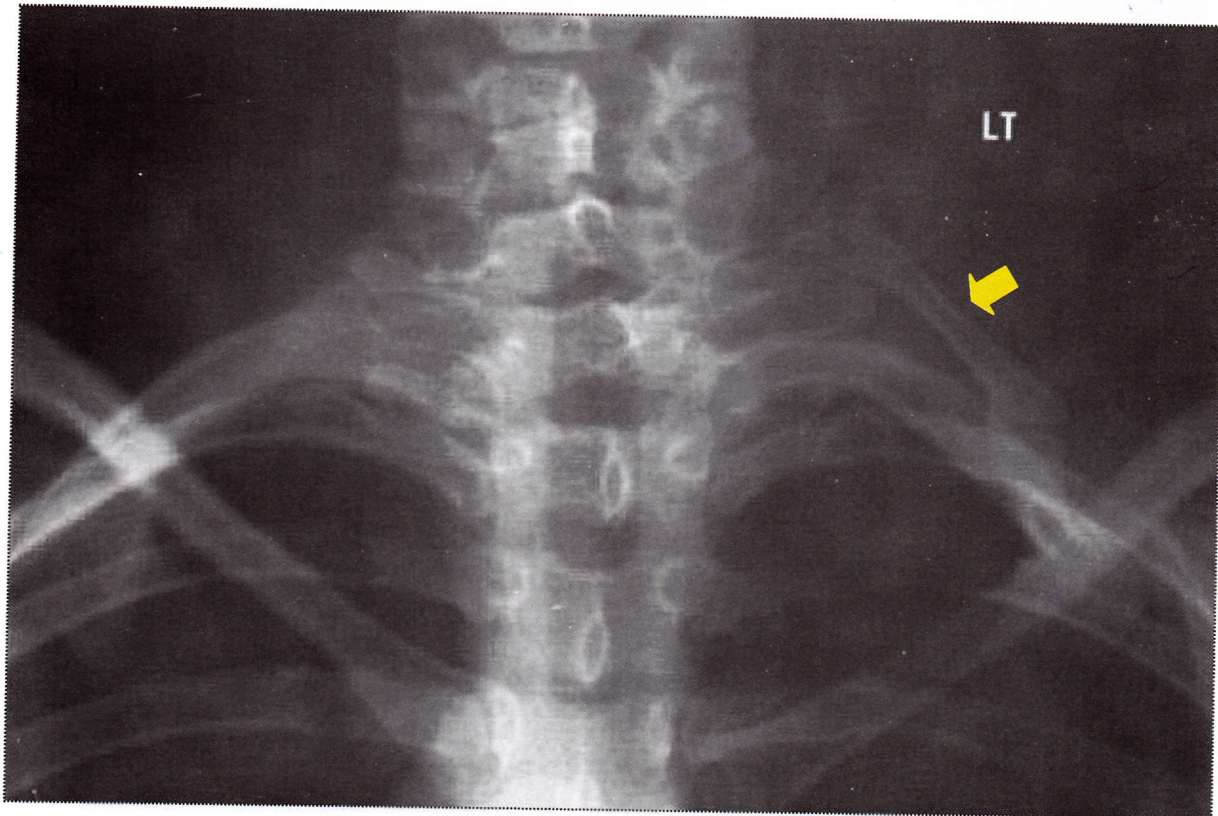
- Seen as cause of obstruction in the x-ray e.g. fracture or dislocation with obstruction of the circulation in the angiography.

Questions

1. Cardiac causes are the most common causes of embolism. **T**
2. Effect of embolism is more dangerous than ligation of the same artery. **T**
3. Presence of known source of embolism is essential to prove the cause of acute ischemia is embolism. **F**
4. Patients with acute thrombosis usually give history of claudication pain. **T**
5. Treatment of post-traumatic ischemia begins with treatment of the cause (reduction of the fracture or dislocation). **T**

Upper Limb Ischemia

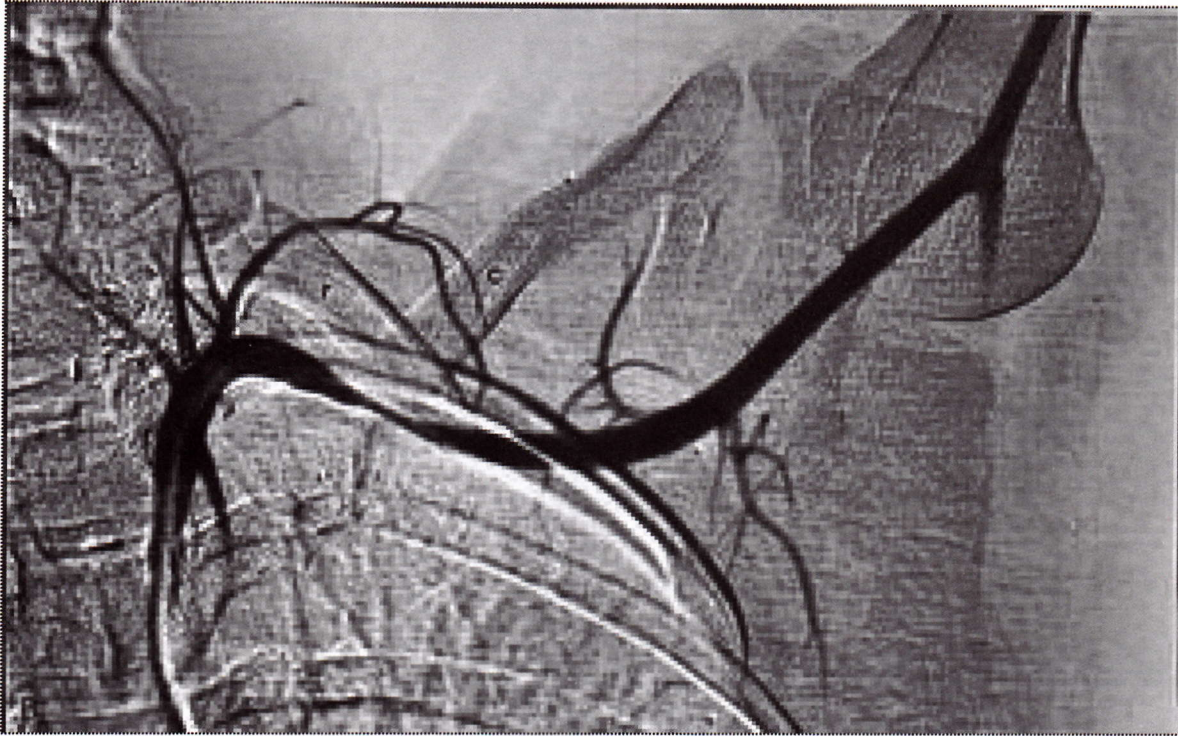
Cervical Rib



X-ray cervical region

- Seen as extra-rib attached to C7 vertebra.

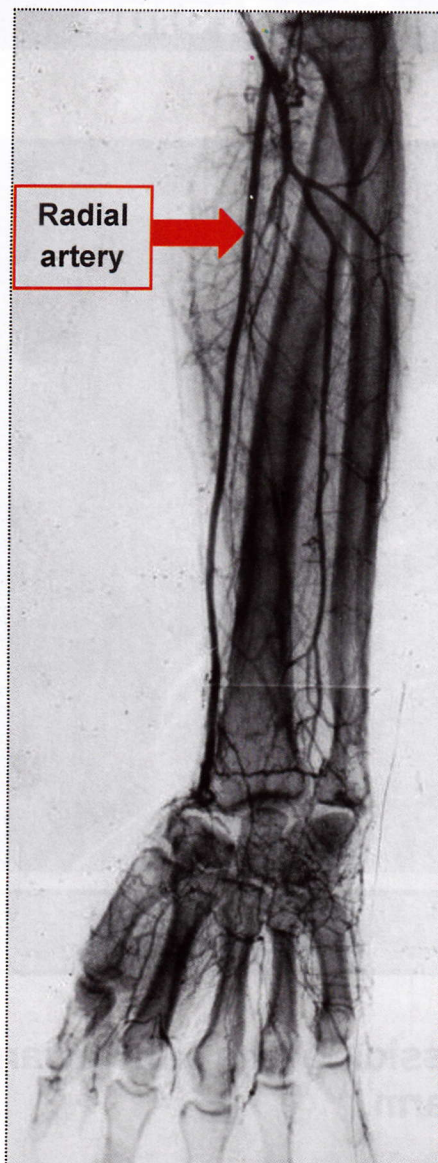
Thoracic Outlet Syndrome



Angiography

- Seen as compression of the subclavian artery with elevation of the arm.

Renaud's Syndrome

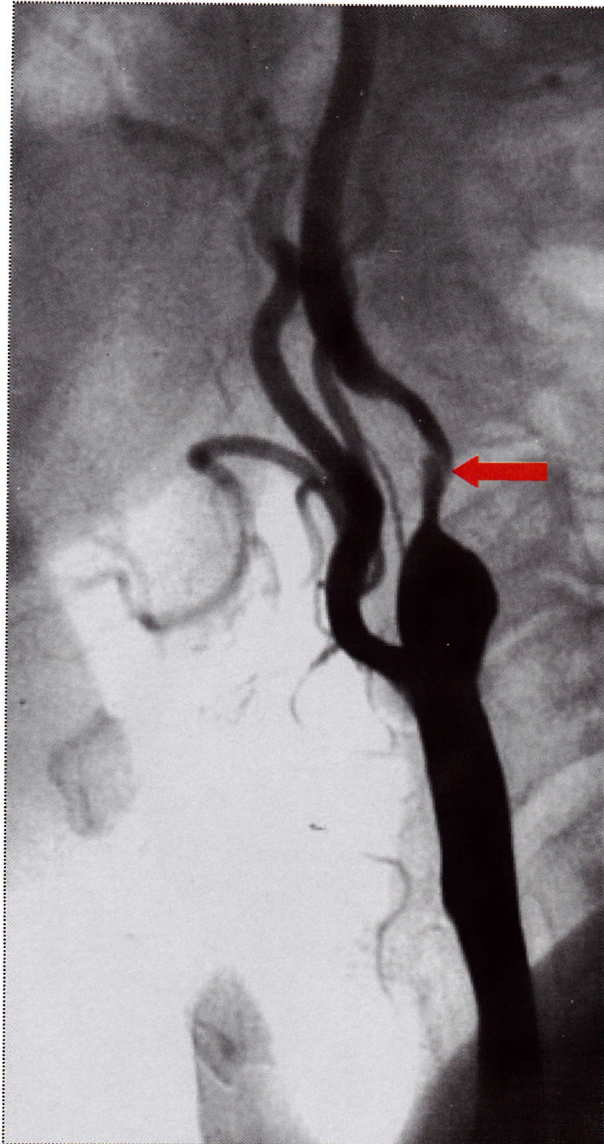


- Seen as defective circulation of the hand with healthy proximal circulation to the level of radial & ulnar arteries

Questions

1. Cervical rib is the most common cause of thoracic outlet syndrome. T
2. Vascular compression is the most common manifestation of thoracic outlet syndrome. F
3. Renaud's disease is common in middle aged females. T

Carotid Artery Stenosis

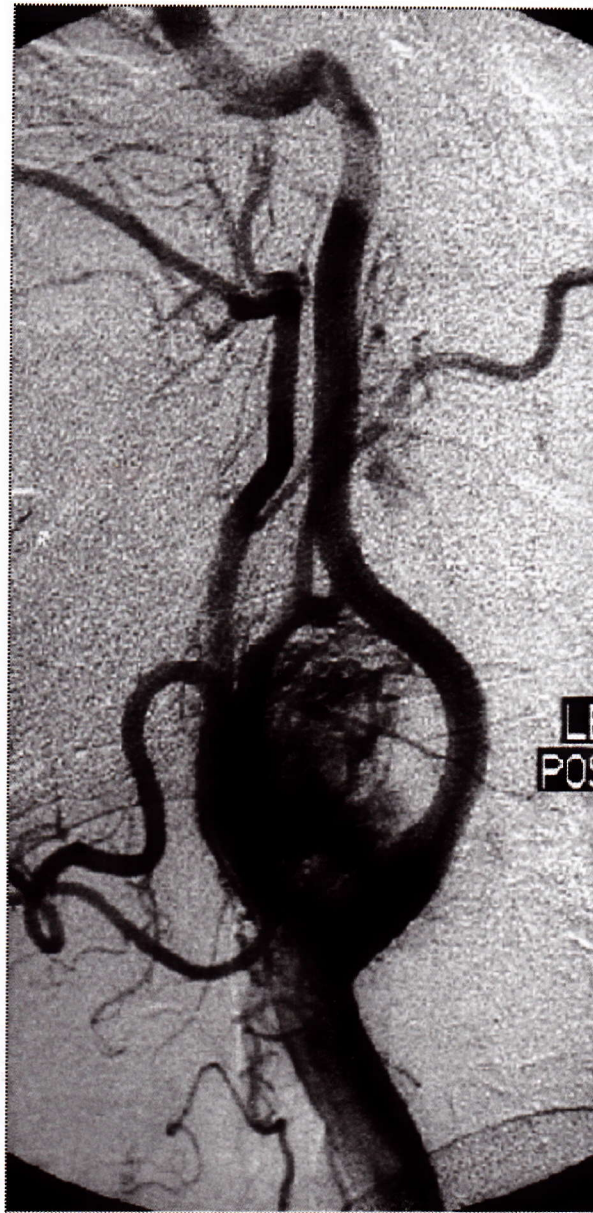


- **Seen as stenosis of the internal carotid artery (the artery which gives no branches in the neck).**

Questions

1. Atherosclerosis is the most important cause of internal carotid artery stenosis. **T**
2. Prophylactic surgical treatment is indicated in more than 70% stenosis of internal carotid artery. **T**
3. Balloon dilatation is the treatment of choice for carotid artery stenosis. **F**

Carotid Body Tumor



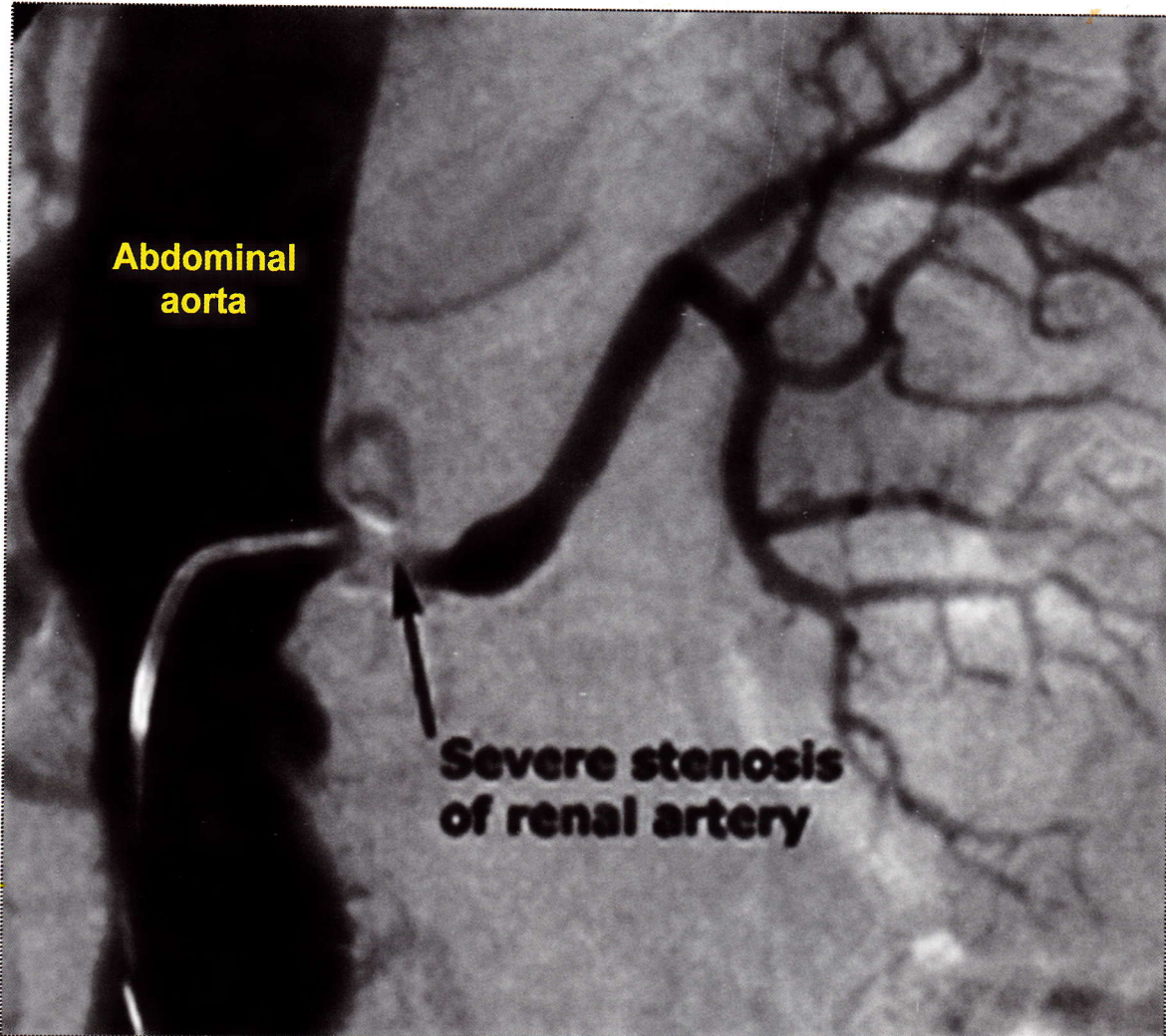
- Seen as highly vascular mass in the branching point of common carotid artery (between internal & external carotid arteries).

Questions

1. This imaging technique is digital subtraction angiography.
2. This tumour originates from carotid sinus.
3. Gel foam embolization is a line of treatment.

T
T
T

Renal Artery Stenosis

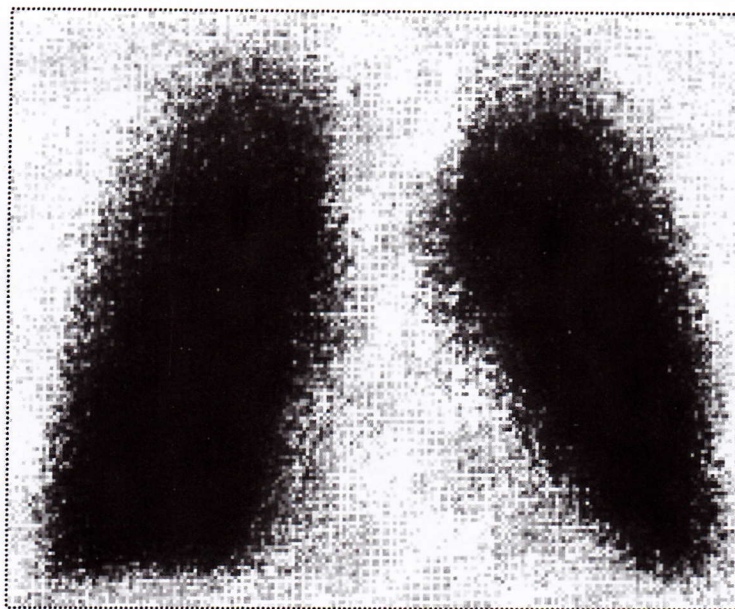


- Seen as stenosis in the proximal part of the renal artery after it originates from abdominal aorta.

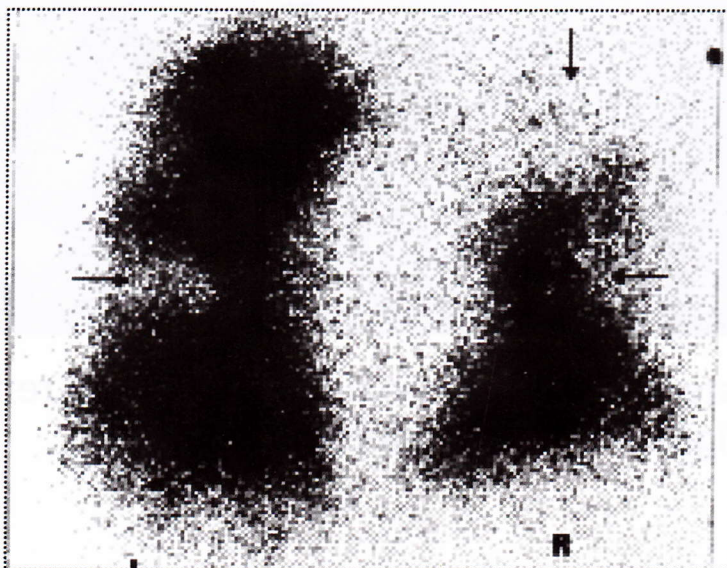
Questions

1. Renal artery stenosis is usually presented with severe hypertension in young age. T
2. Atherosclerosis is a cause of renal artery stenosis. T
3. Balloon dilatation & stenting is a line of treatment of renal artery stenosis. T

Pulmonary Embolism

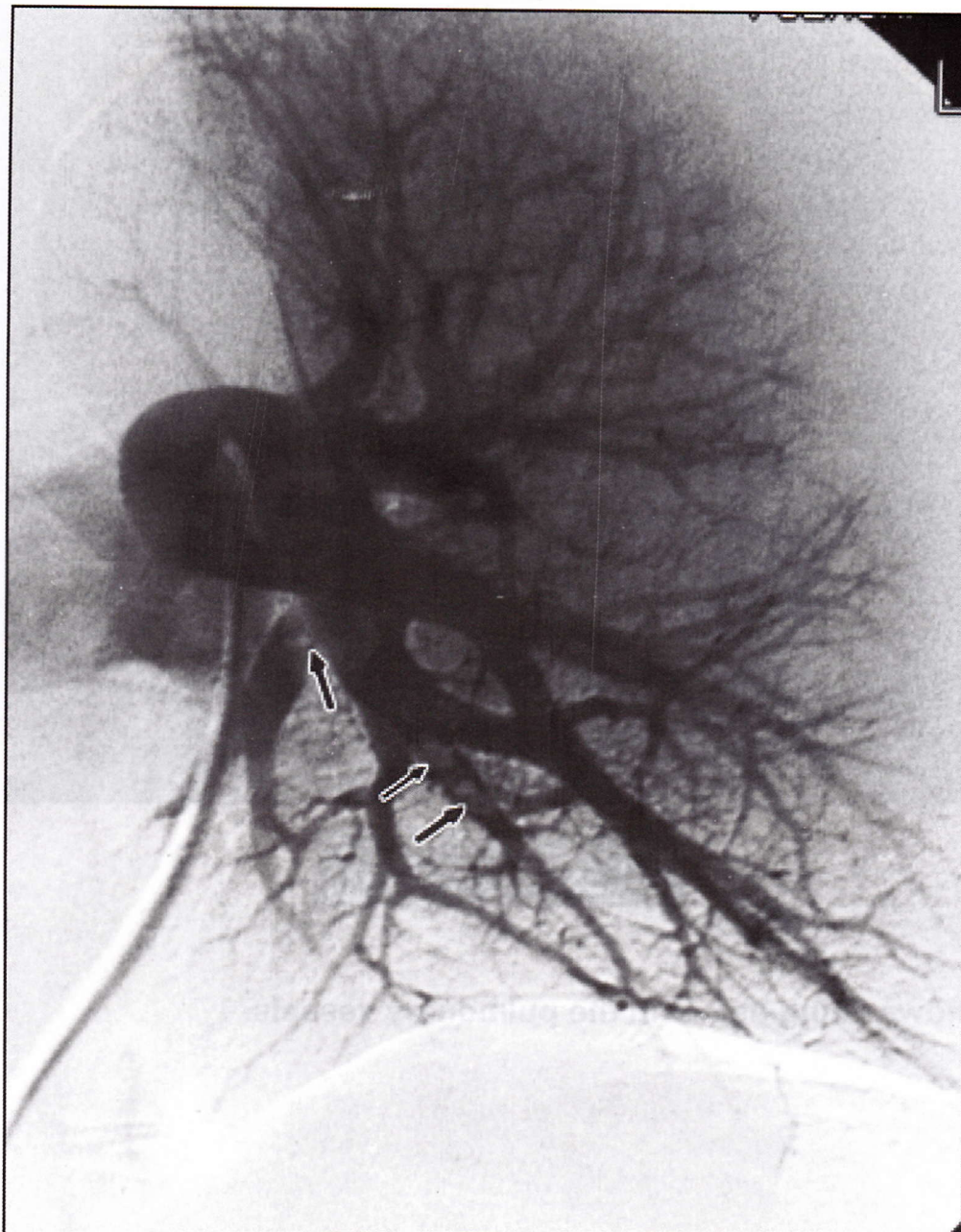


■ Shows normal pulmonary ventilation.



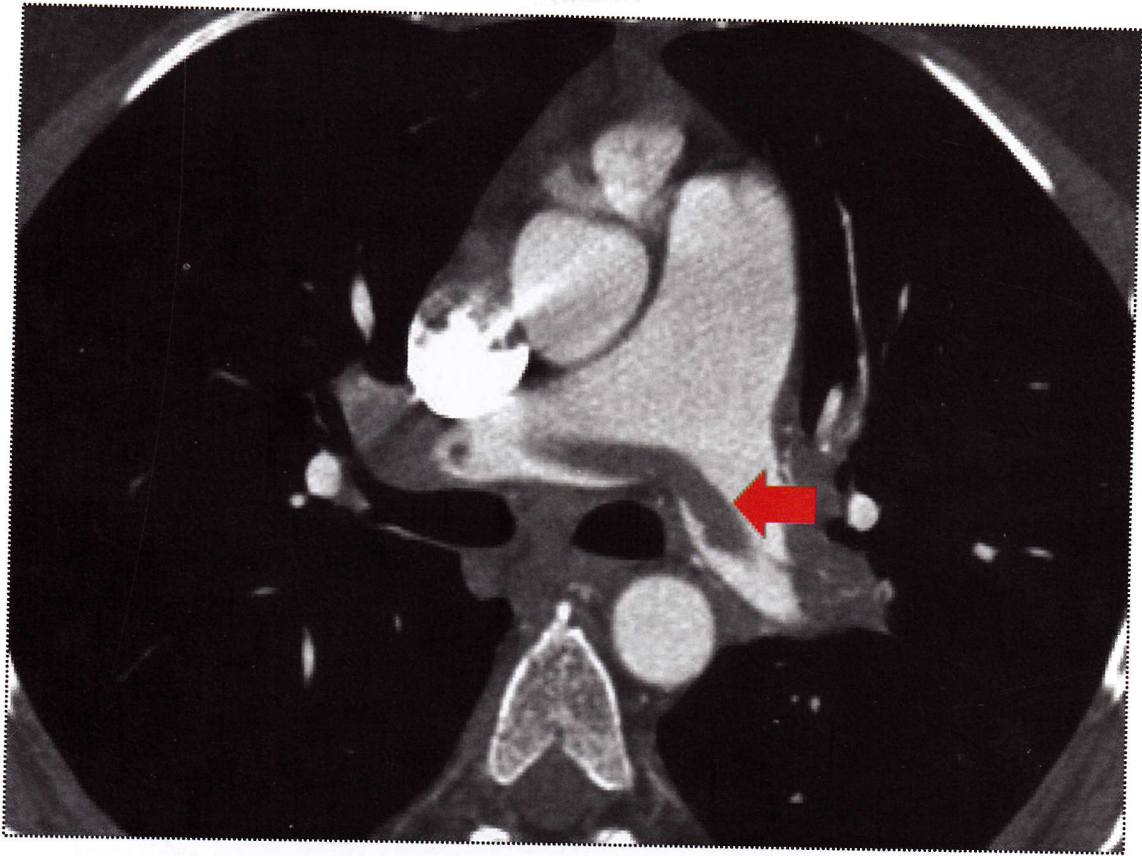
■ With impaired pulmonary perfusion.

Ventilation – perfusion scan
(V/Q scan)



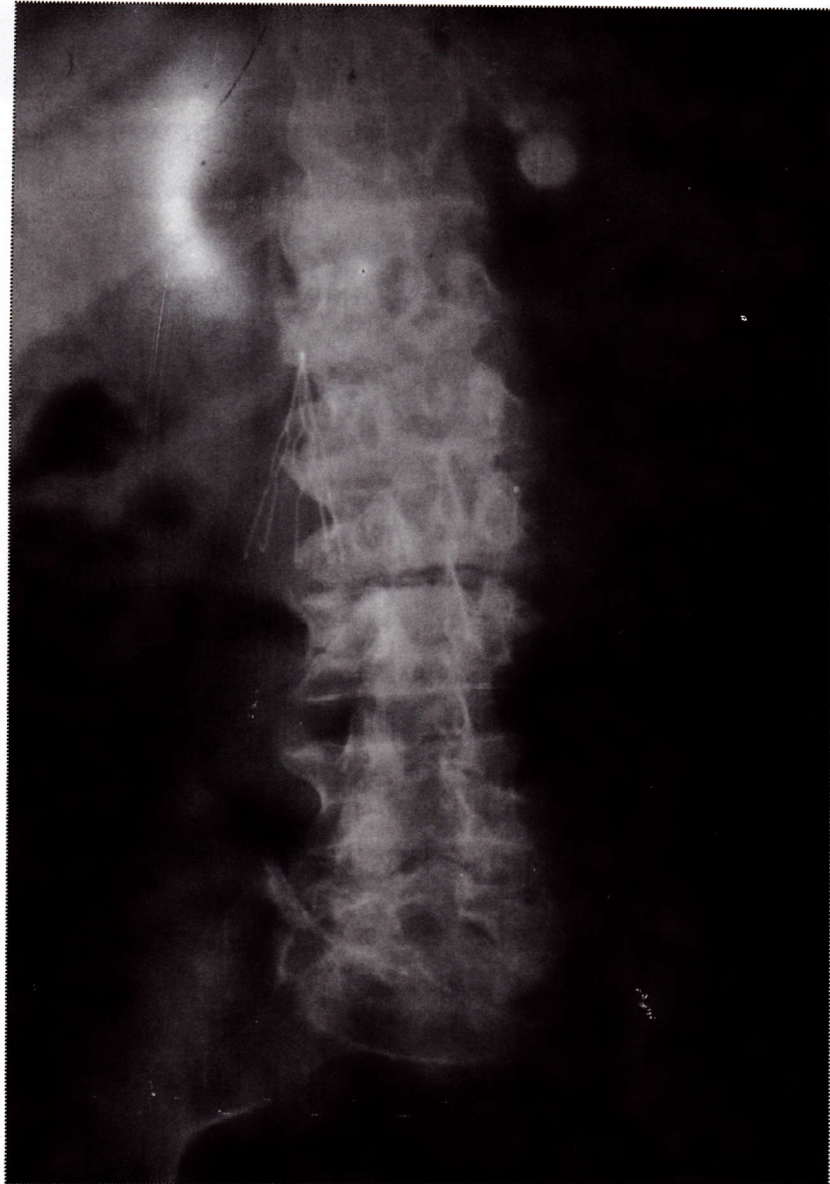
Pulmonary angiography

■ Shows filling defects in the pulmonary vessels.



Spiral CT

- Shows filling defect in the pulmonary vessels.



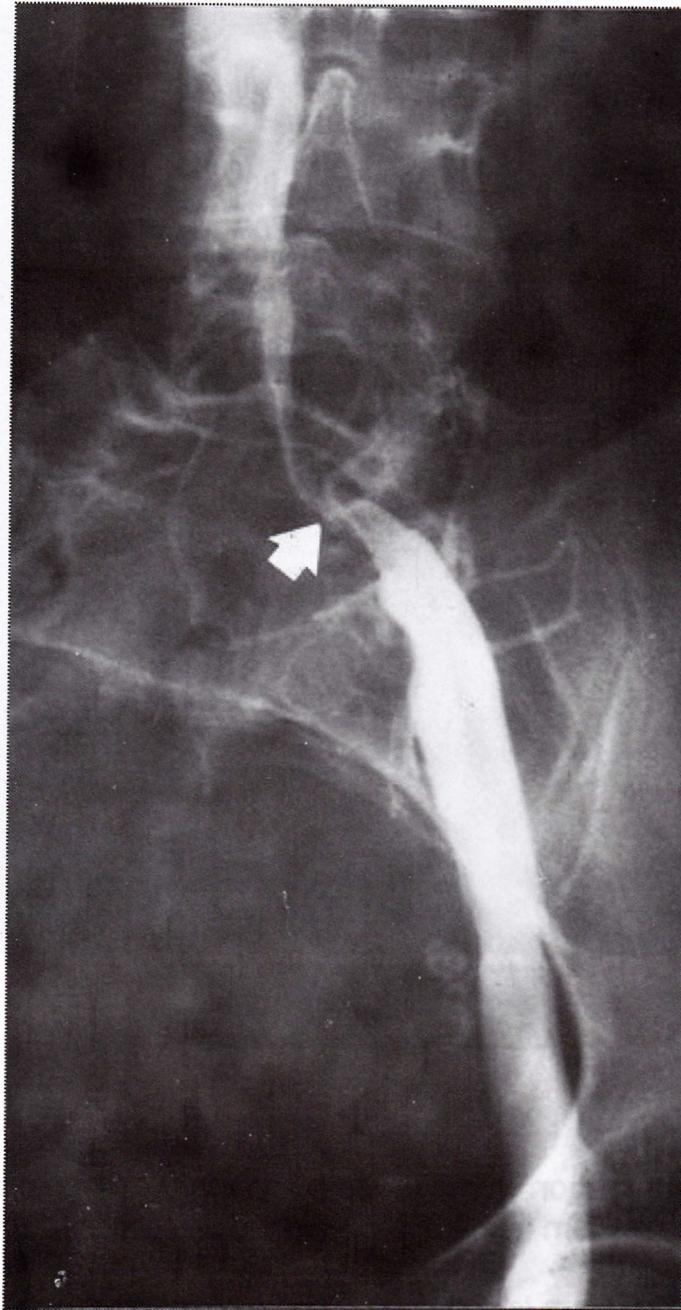
IVC filter x-ray

Questions

1. The best investigation to diagnose pulmonary embolism is spiral CT. **T**
2. Pulmonary embolism is always preceded by history suggestive of DVT. **F**
3. Pulmonary embolism is a differential diagnosis for tension pneumothorax & myocardial infarction. **T**

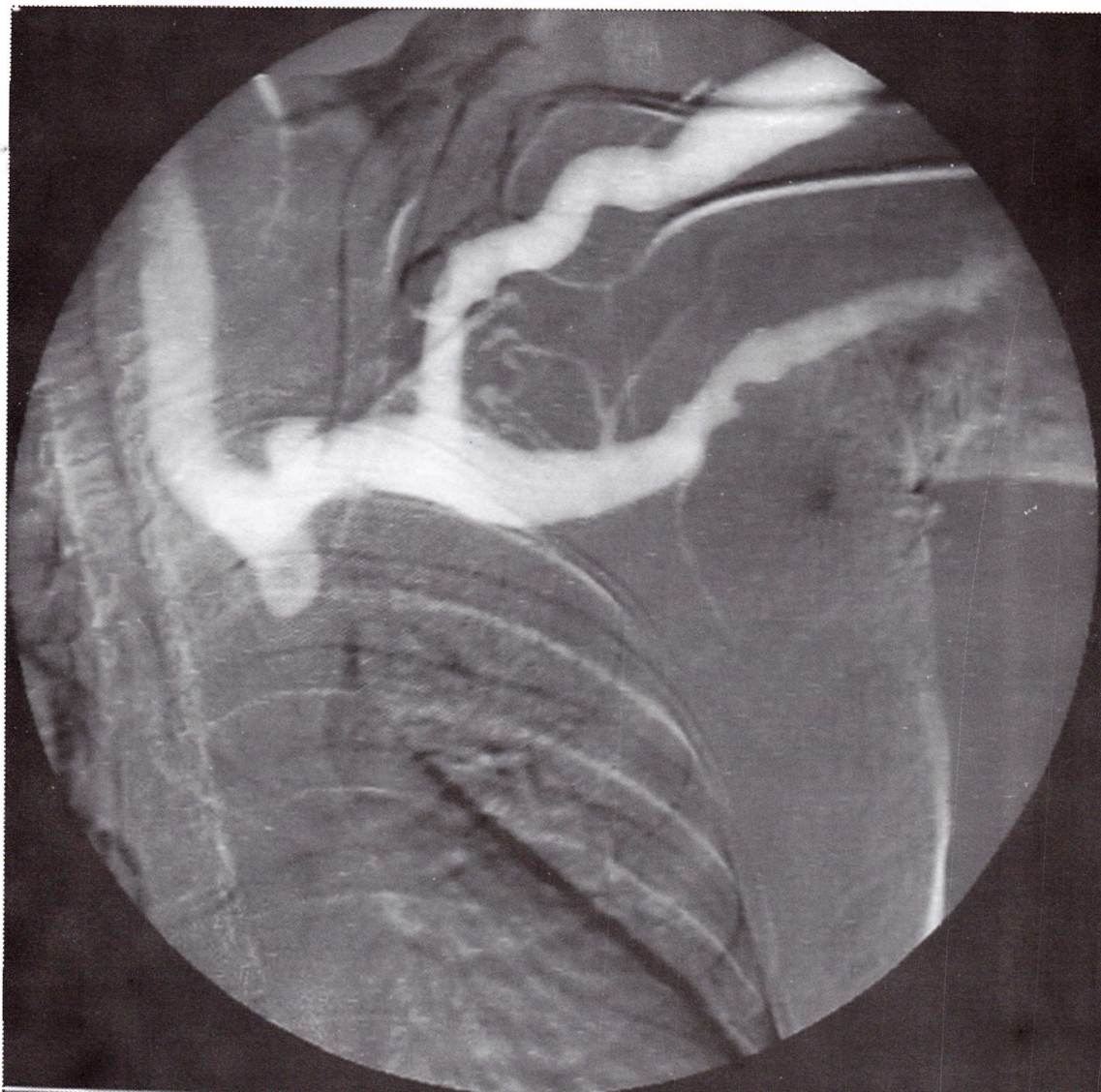
Venography

DVT



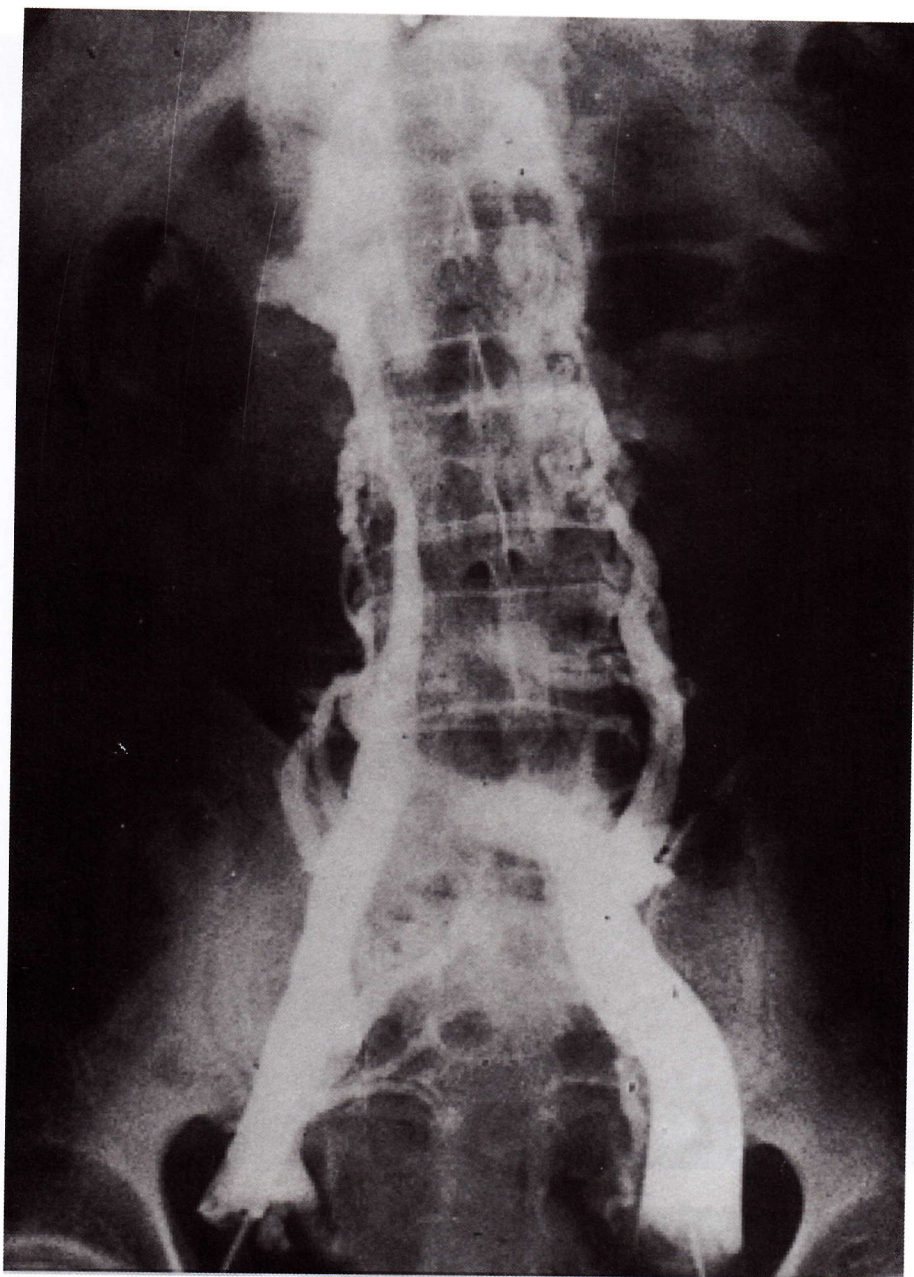
- Seen as obstruction of the flow of the vein in ascending venography.

SVC Occlusion



Digital subtraction angiography

IVC Obstruction



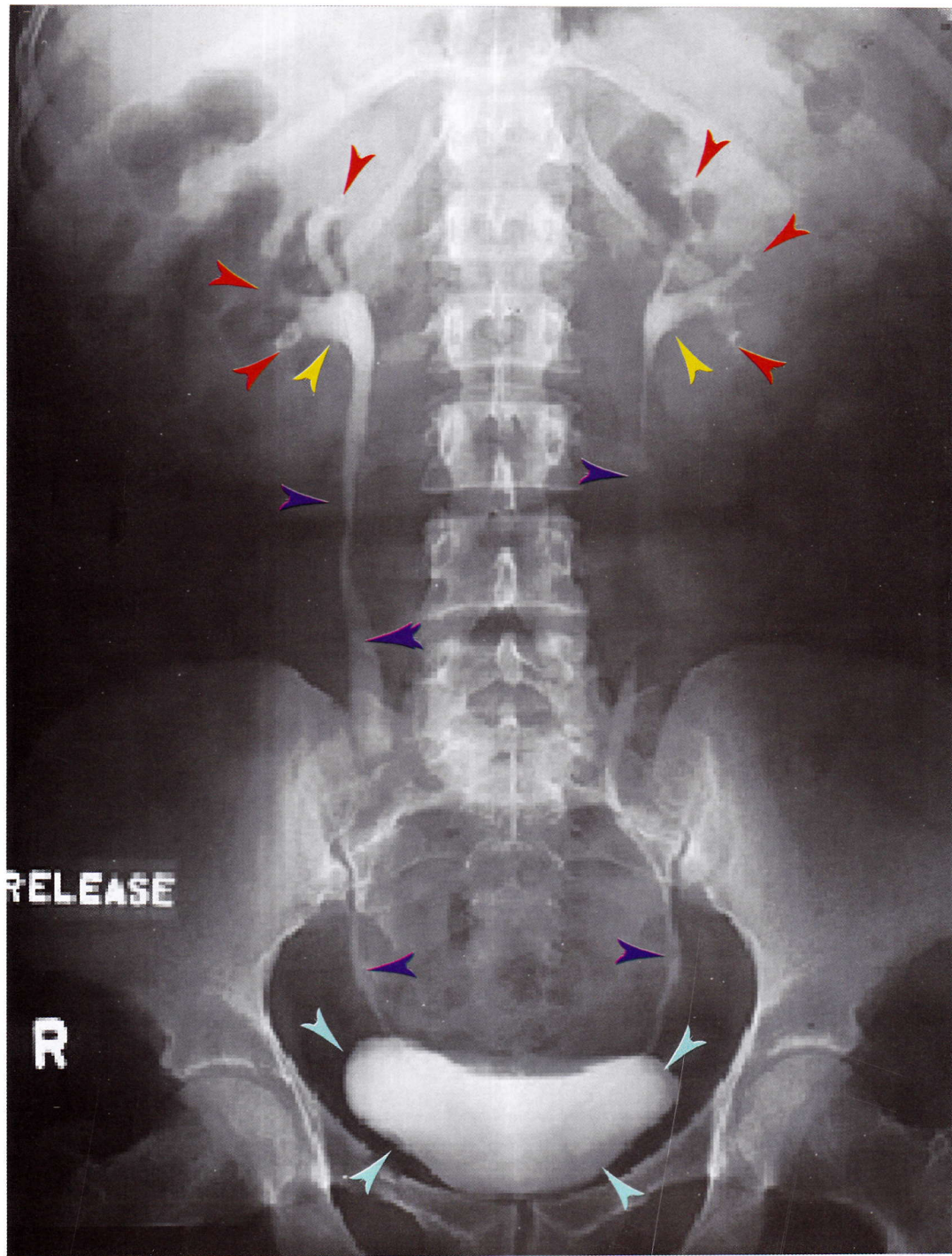
-7-

Urosurgery Radiology

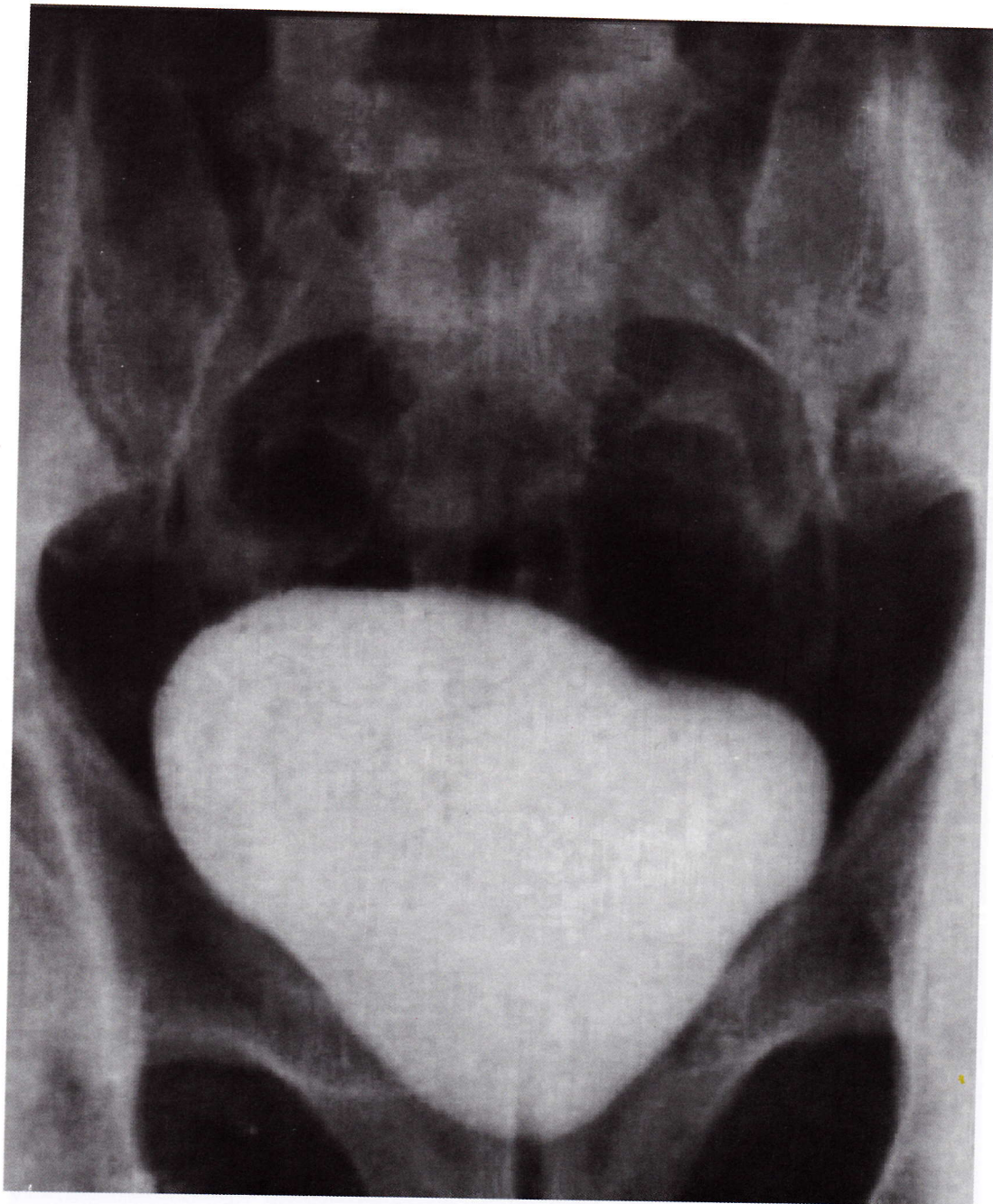
Normal Appearance



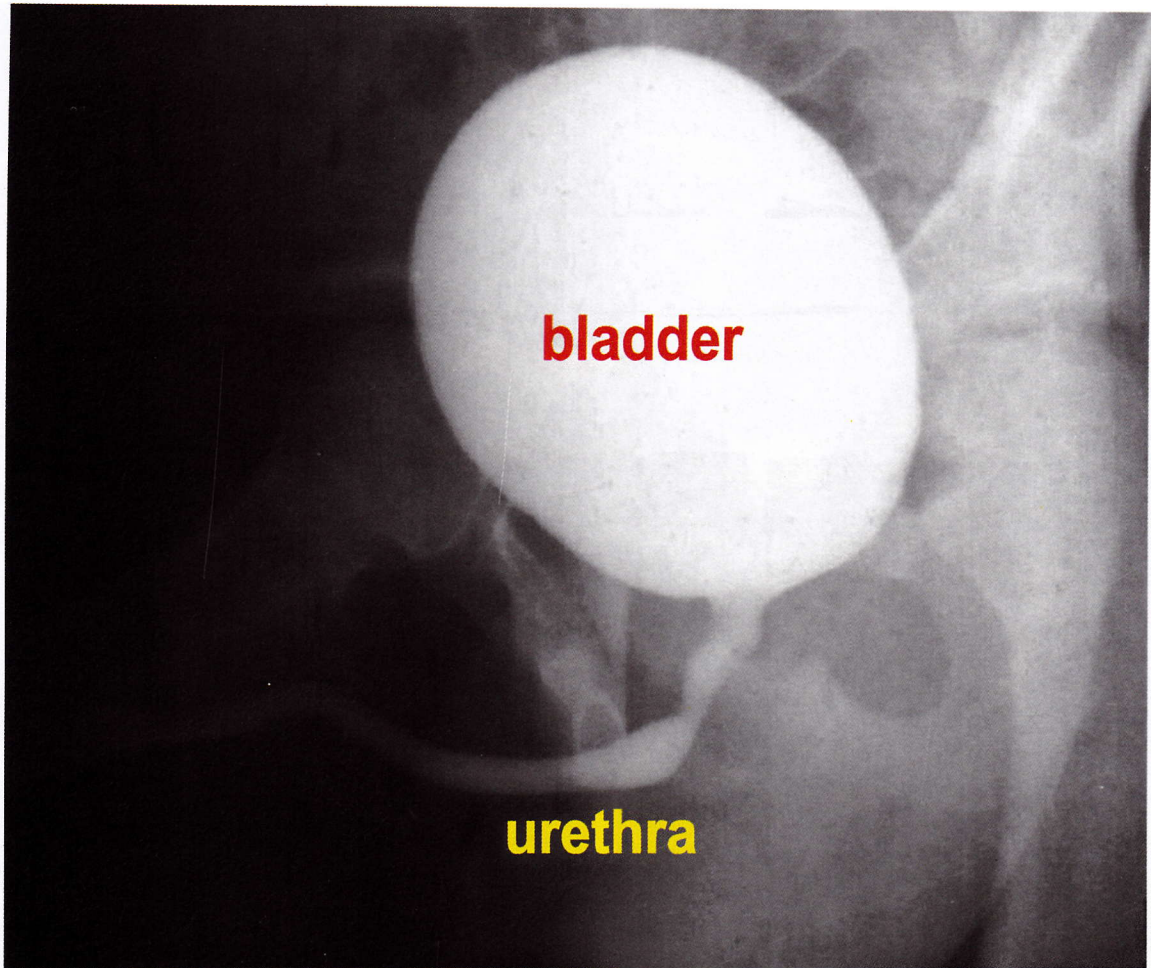
■ Normal Plain Urinary Tract PUT.



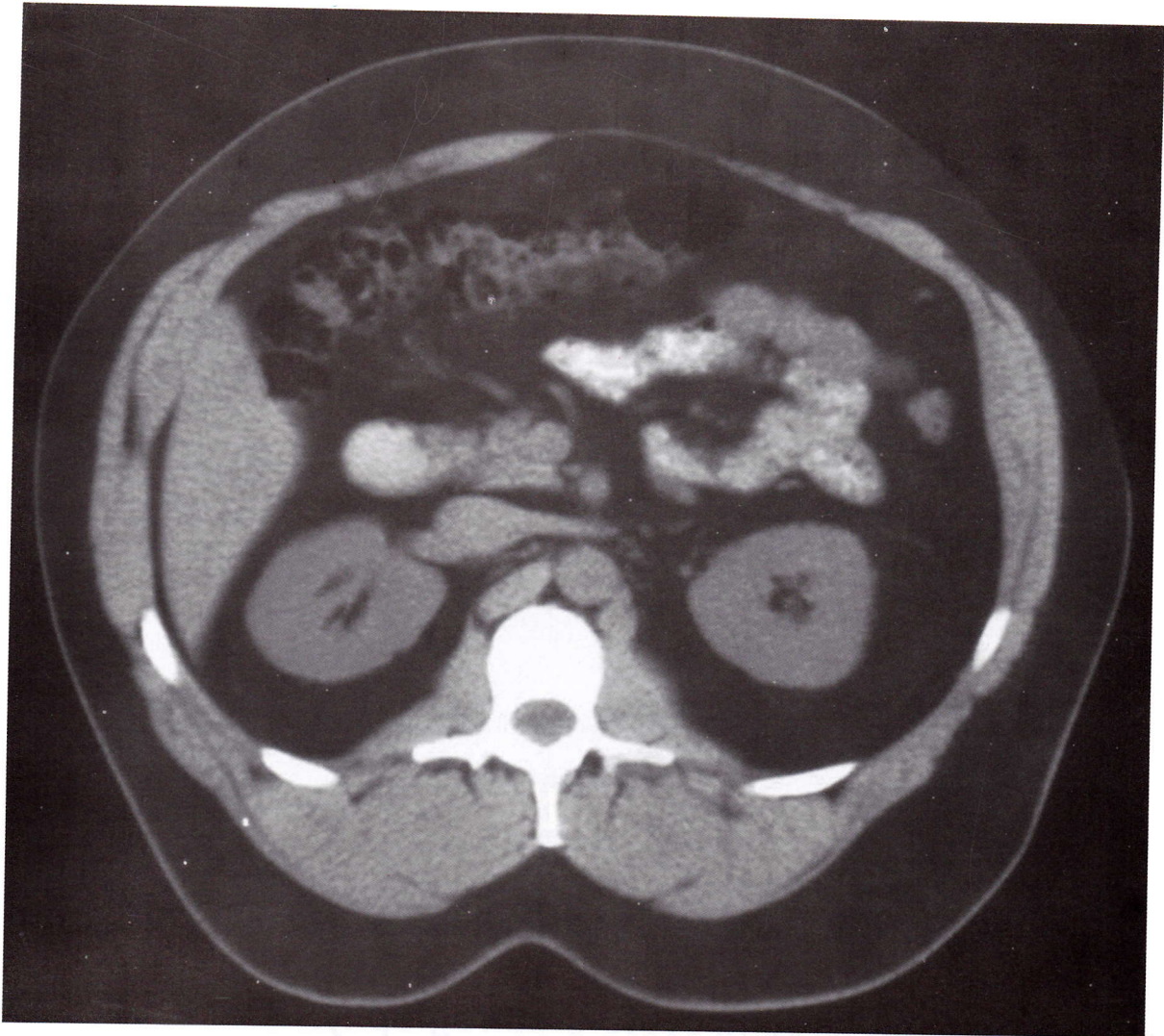
■ Normal Intra-Venous Urography IVU.



■ Normal cystography.



■ Normal micturating cysto-urethrography.



■ Normal CT abdomen showing kidneys.

Congenital Anomalies

Double Pelvis & Ureter



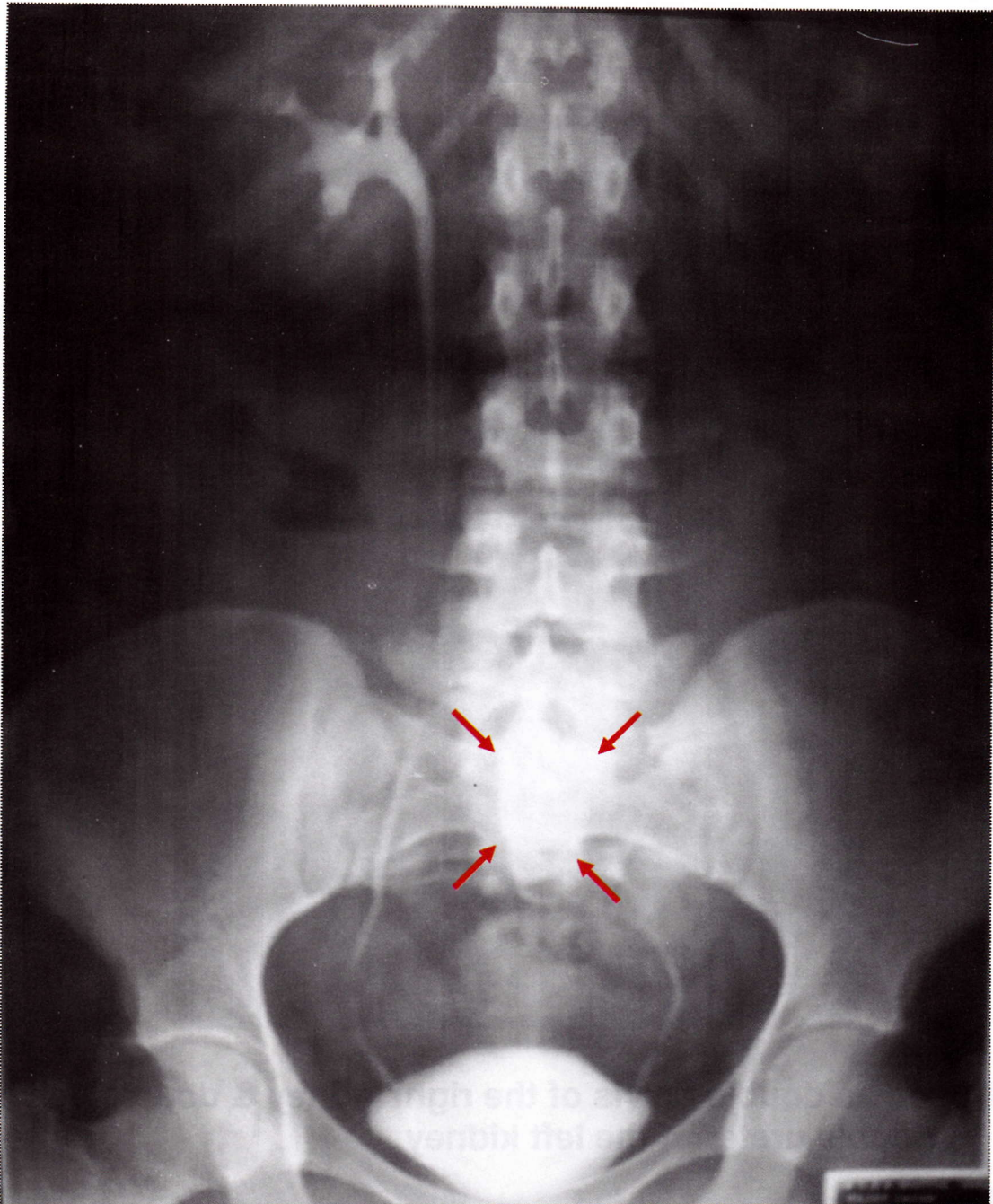
- Seen as double pelvis of the right kidney & double pelvis & double ureter of the left kidney.

Questions

1. This condition is usually asymptomatic & accidentally discovered.
2. The lesion may be complete or incomplete.
3. Surgical treatment is indicated only if the patient is complaining.

T
T
T

Ectopic kidney (Lt.)

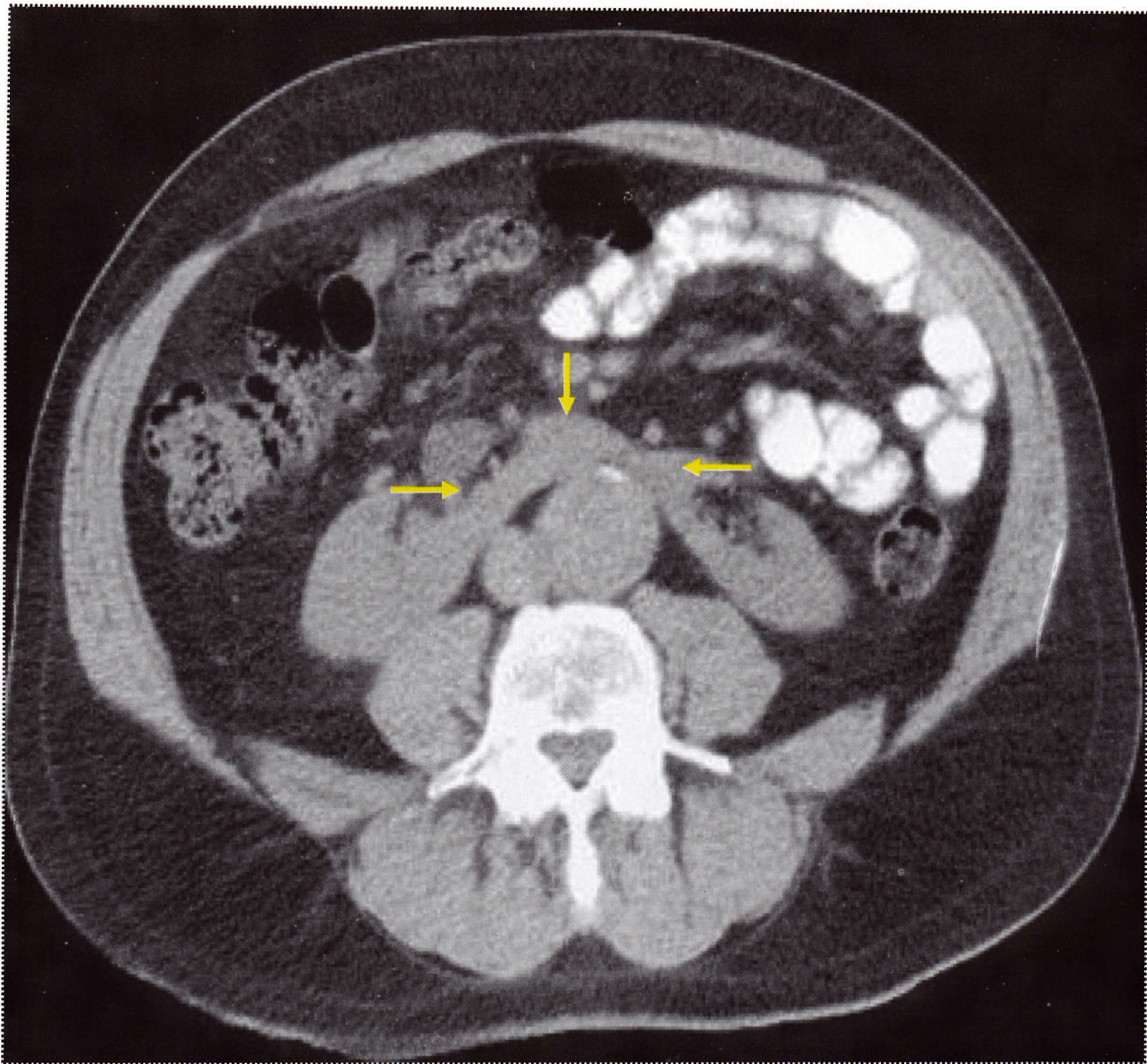


- Seen as a kidney located outside its normal place
- e.g. pelvic kidney with short ureter or kidney located on the opposite side below the other kidney.

Horse Shoe Kidney



- IVU showing malrotation of both kidneys seen as calyces directed to medial side together with calyces directed to lateral side.



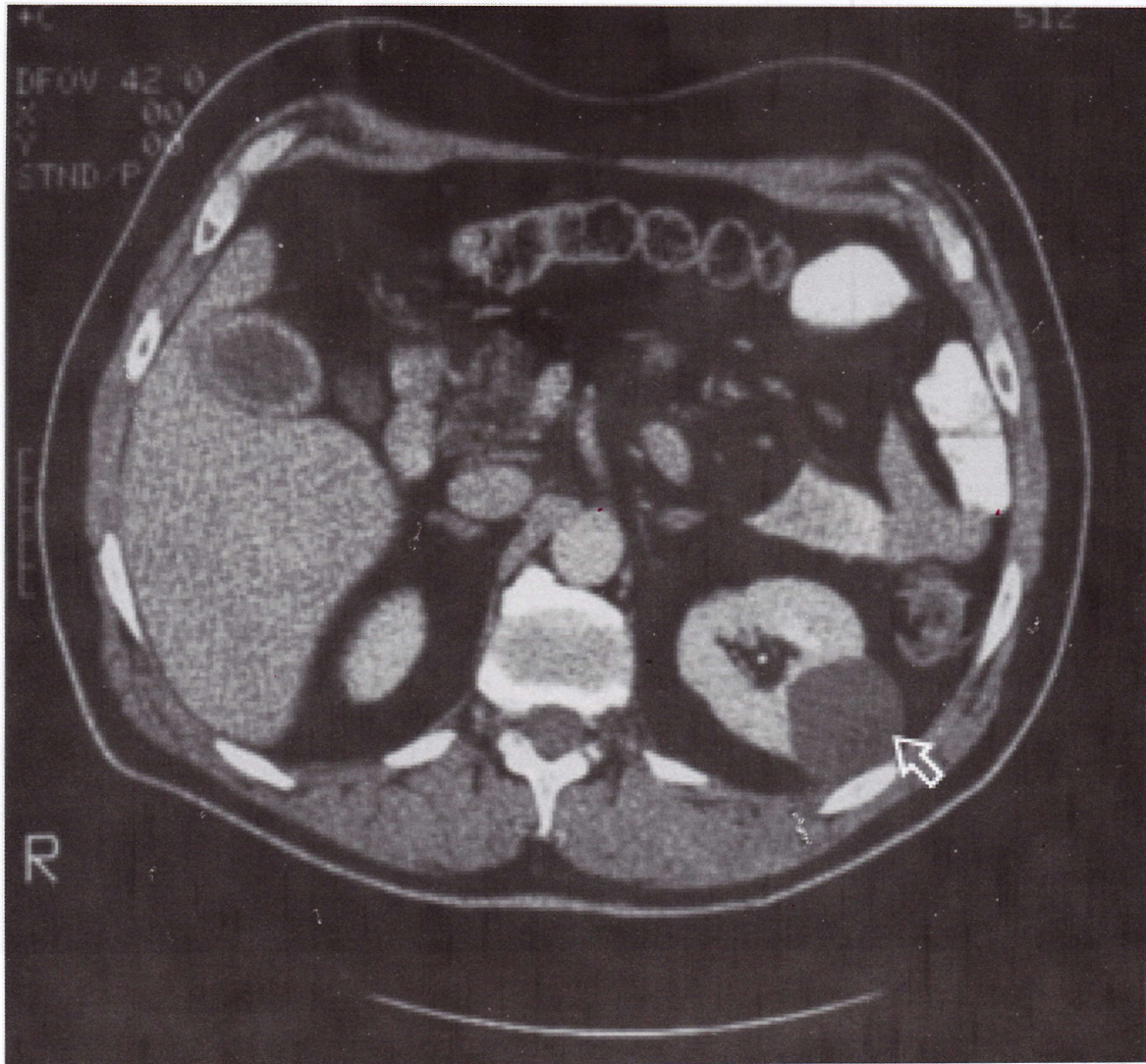
■ **CT showing fusion of both kidneys in their lower poles.**

Questions

1. These kidneys are located at lower level than normal.
2. This condition is usually asymptomatic.
3. Surgical treatment is required.

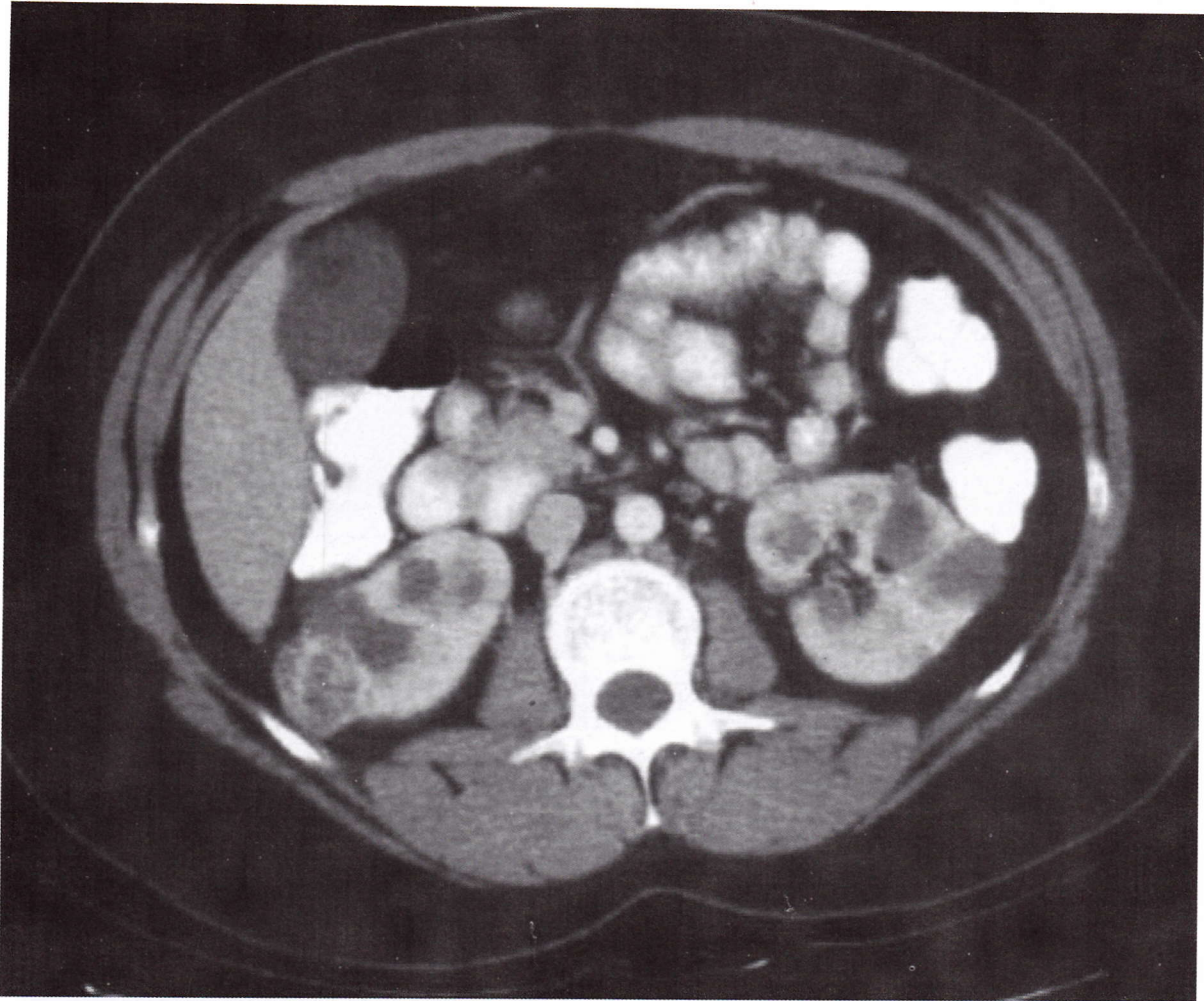
T
T
F

Simple Renal Cyst



■ Seen as homogenous well defined cyst.

Polycystic Kidneys



- CT scan with IV contrast showing enlarged both kidneys with multiple cysts.



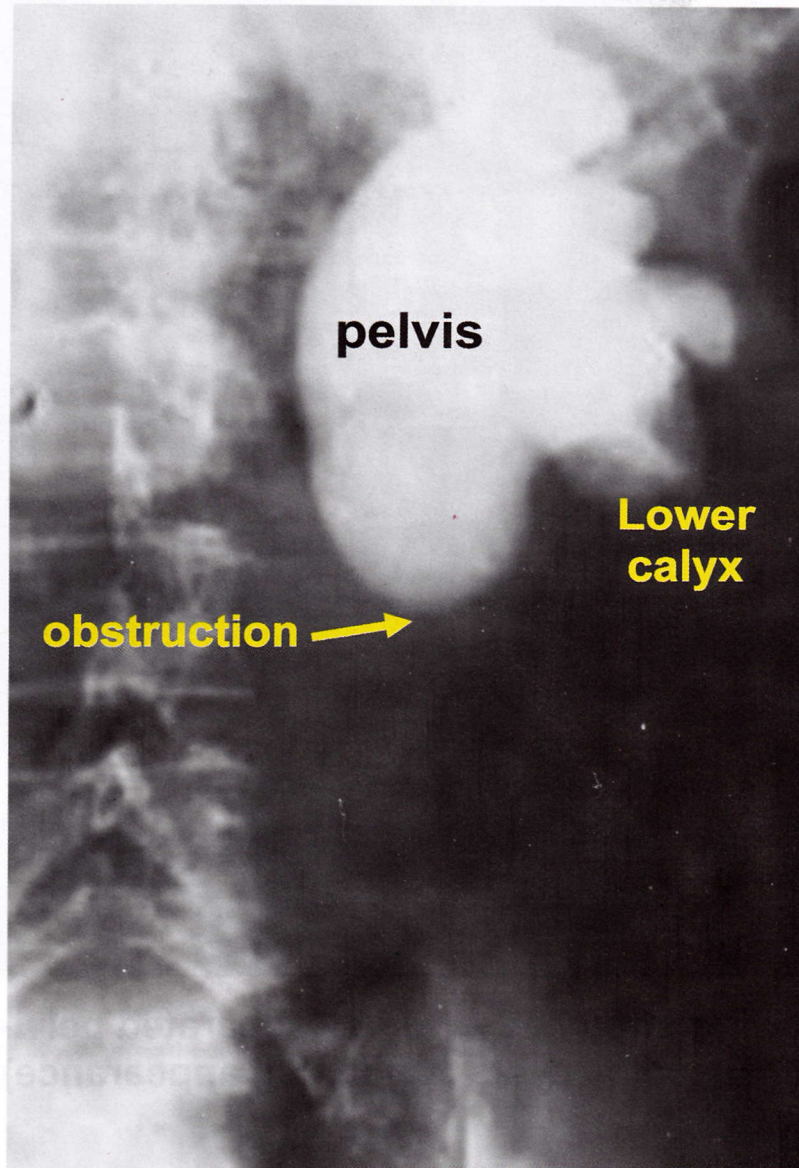
■ **IVU showing stretched & widely separated pelvi-calyceal system caused by cysts (spider leg appearance).**

Questions

1. This disease is inherited as autosomal dominant trait.
2. Patients usually complain of flank pain & hematuria in young age.
3. Chronic renal failure is a common complication of this disease.
4. Nephrostomy is a line of treatment for this condition.
5. Family screening has special importance for this disease.

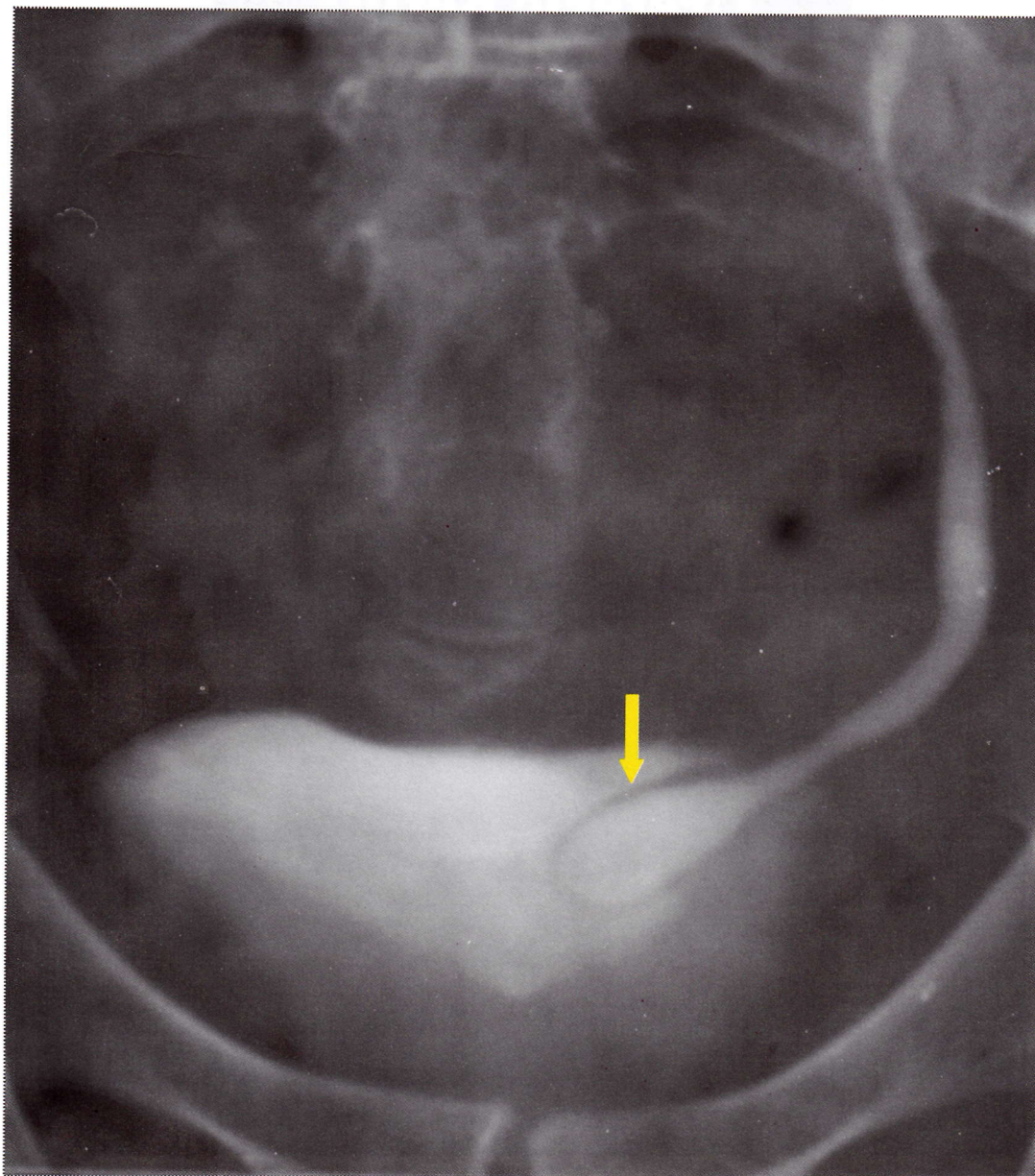
T
F
T
F
T

Pelvi-Ureteric Junction (PUJ) obstruction



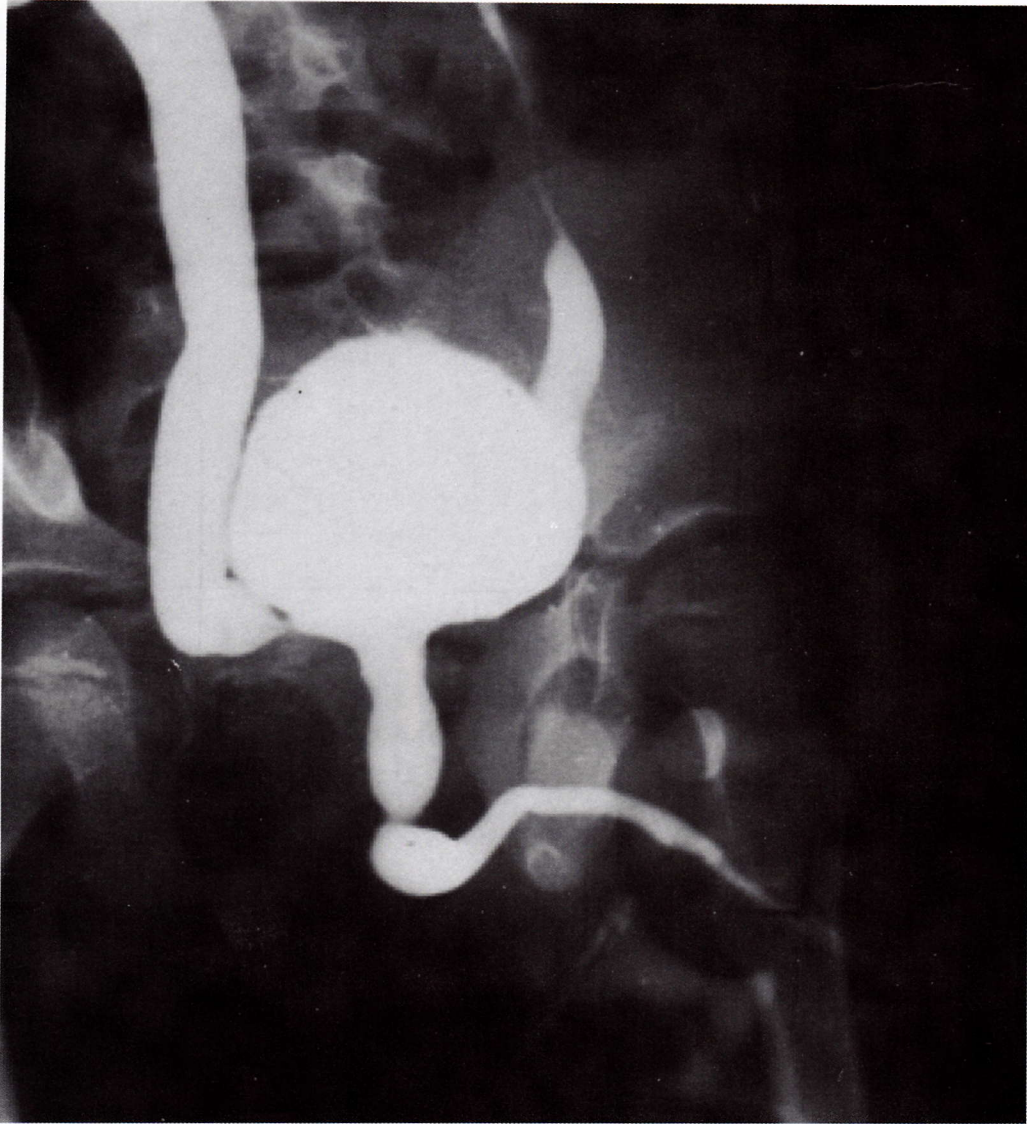
■ **Seen as markedly dilated pelvis & calyces with normal ureter.**

Ureterocele



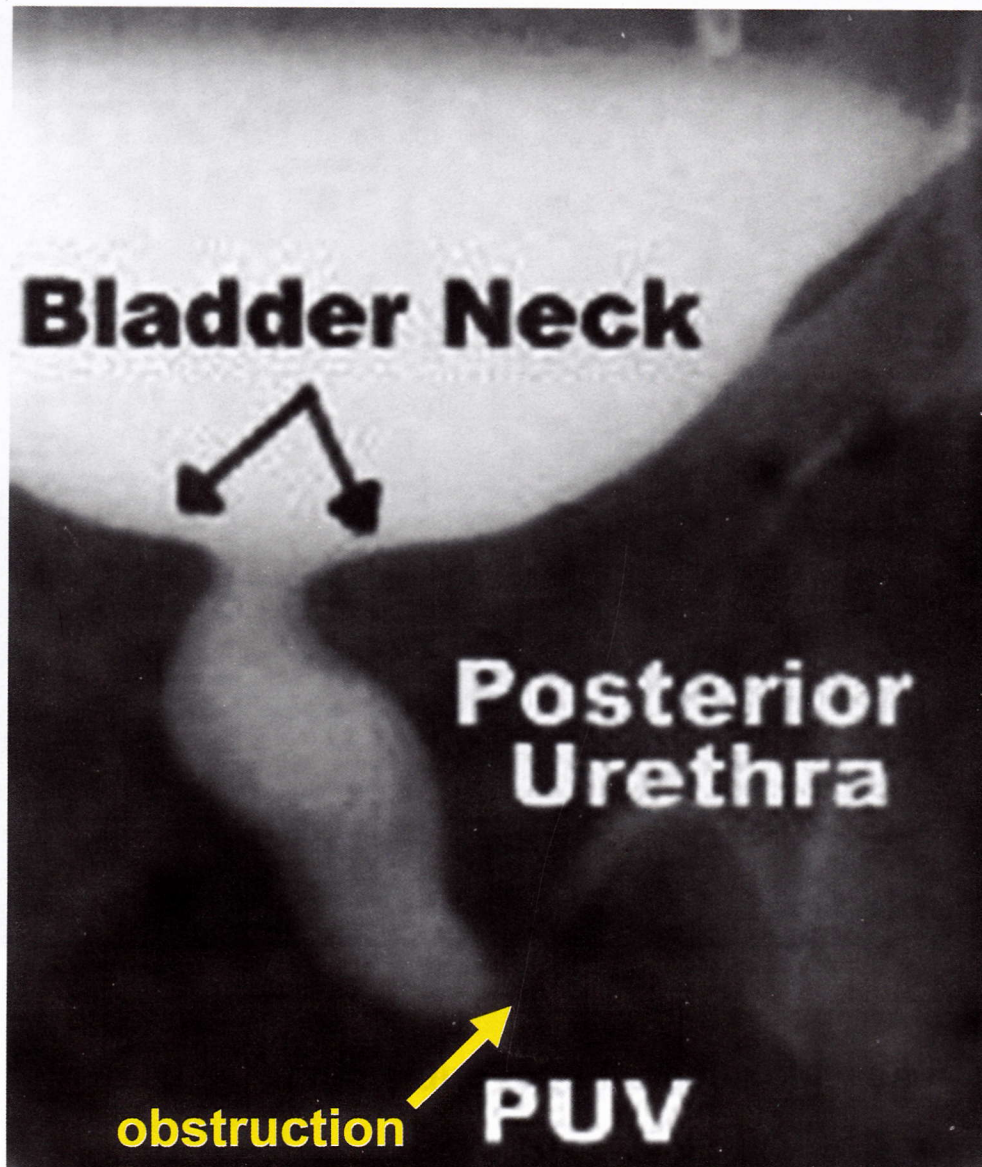
- Seen as ballooning of intramural part of the ureter with mild back pressure on the ureter (cobra head appearance).

Bilateral Vesico-Ureteric Reflux



- Micturating cysto-urethrogram seen as dilated ureters filled with contrast material while the patient micturates.

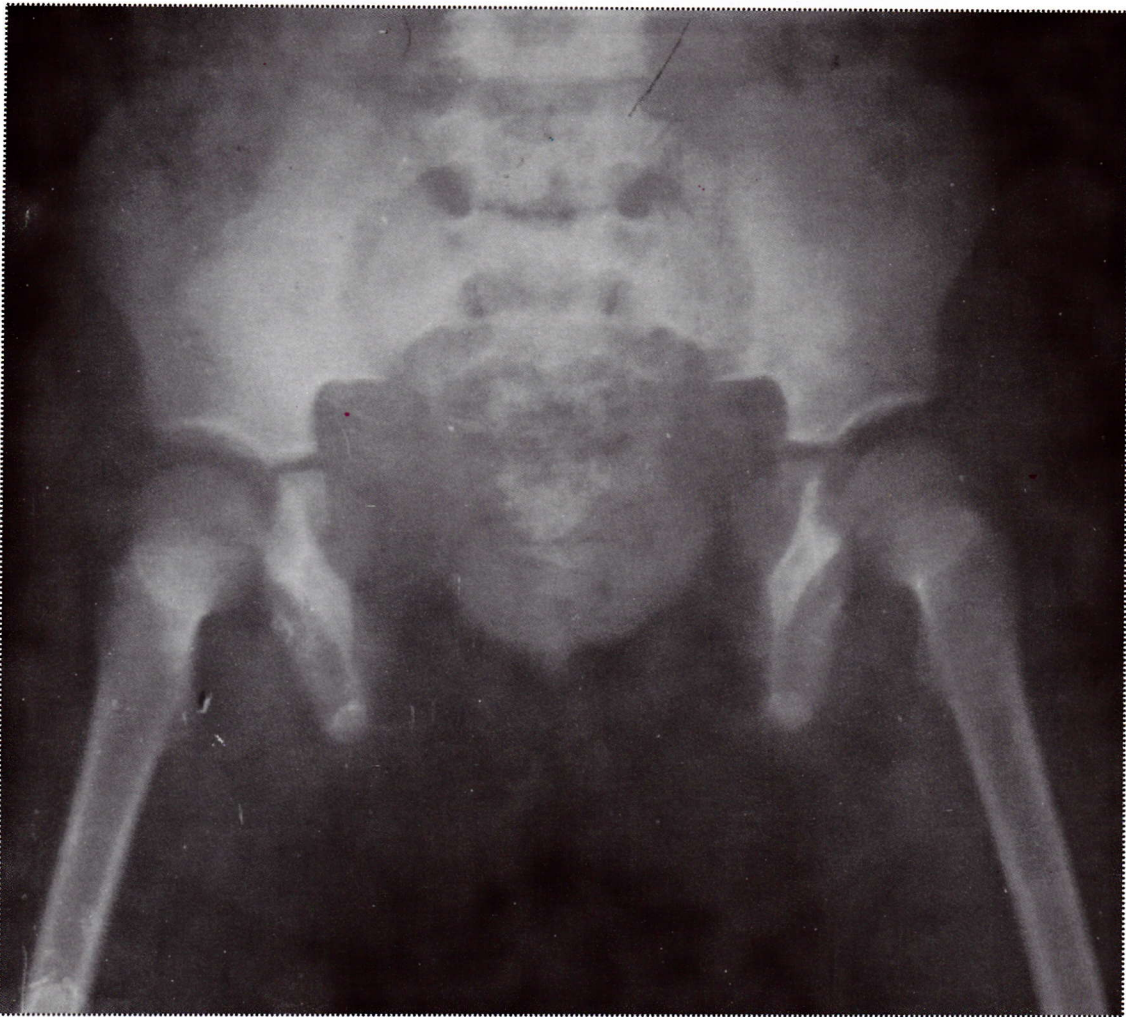
Posterior Urethral Valve



Micturating cysto-urethrography

- Seen as obstruction of the urethra with proximal dilatation.

Bladder Extrophy



■ **X-ray**

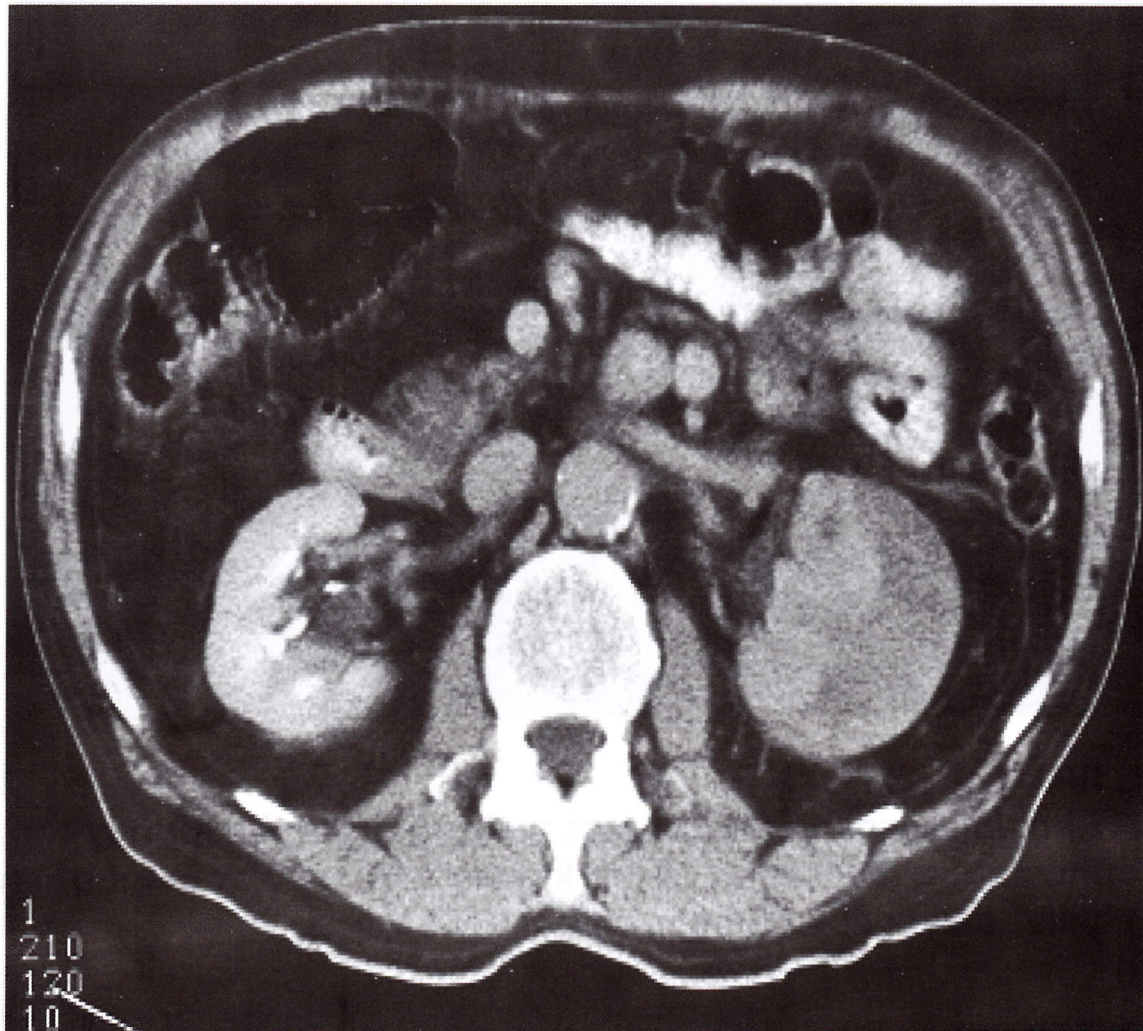
■ **Seen as wide separation of pubic rami.**

Questions

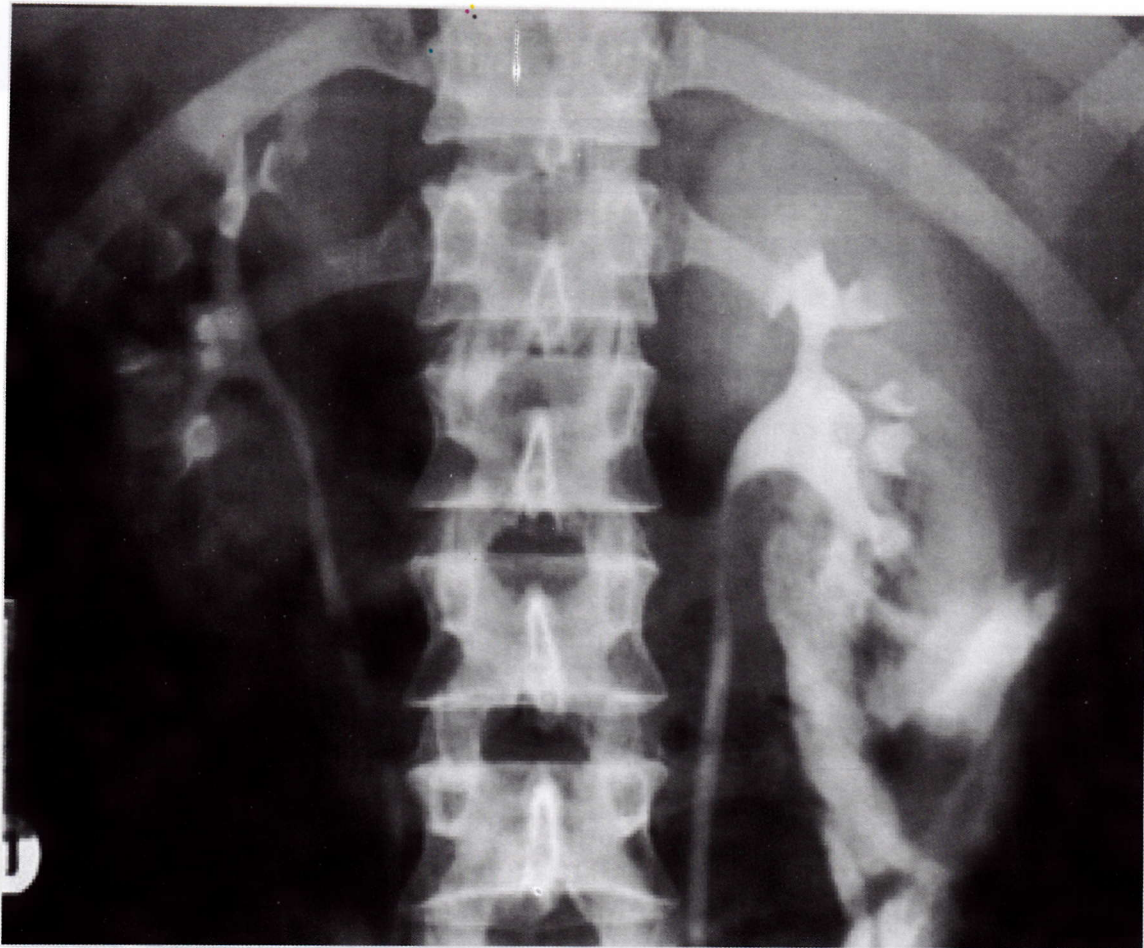
1. Absence of anterior abdominal wall & bladder wall is associated to this condition. **T**
2. The patient is incontinent to urine. **T**
3. Waddling gait is a common presentation. **T**
4. Malignancy & renal failure are common complications. **T**
5. Surgical treatment is the only line of treatment. **T**

Trauma

Renal Injury



- CT scan
- Showing sub-capsular hematoma either alone or together with peri-nephric hematoma.



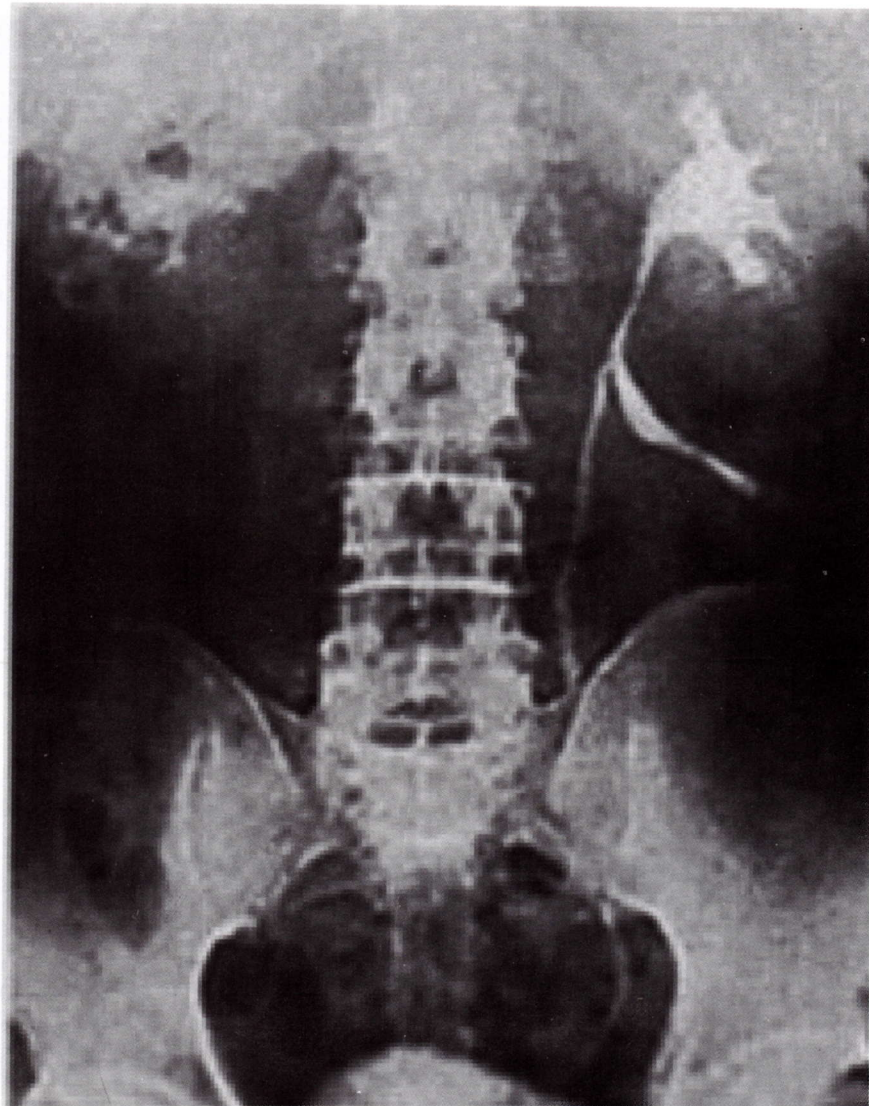
■ IVU

- Showing escape of contrast material from the kidney indicating laceration of the kidney with involvement of the pelvi-calyceal system.

Questions

1. Patients may present with hematuria & pain in the flank. T
2. Patients may present with abdominal distention & vomiting. T
3. Shock is a possible complication. T
4. Conservative treatment is a line of treatment in non-complicated cases. T

Ureteric Injury



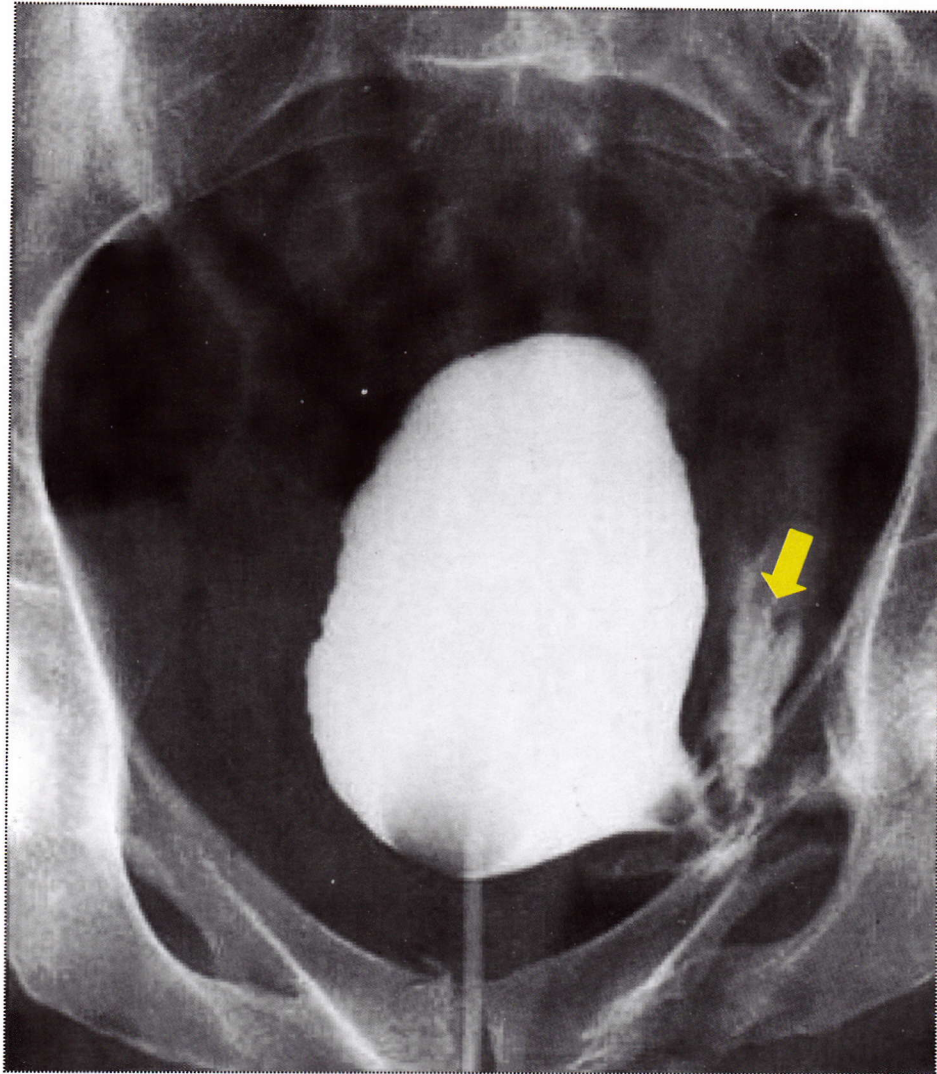
■ **Showing escape of contrast material from the injured ureter.**

Questions

1. The main cause of ureteric injury is iatrogenic during ureteric catheterization.

T

Urinary Bladder Injury



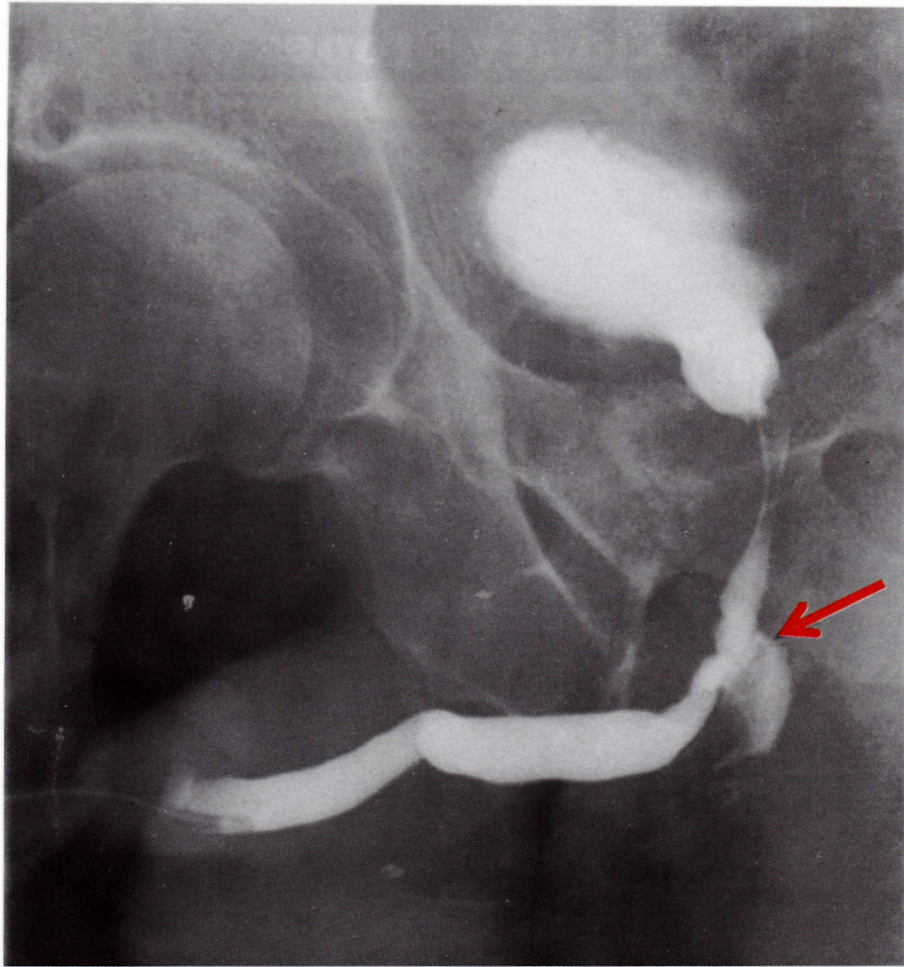
- Showing escape of contrast material from the bladder either to the pelvis with associated fracture seen in the pelvis or upwards in intra-peritoneal rupture.

Questions

- 1- This investigation is ascending cystography.
- 2- Patients may present with urine retention.
- 3- Urgent catheterization is required.
- 4- Surgical treatment is the only line of treatment.

T
F
F
T

Urethral Injury



■ **Ascending cysto-urethrography showing escape of contrast material from the urethra.**

Questions

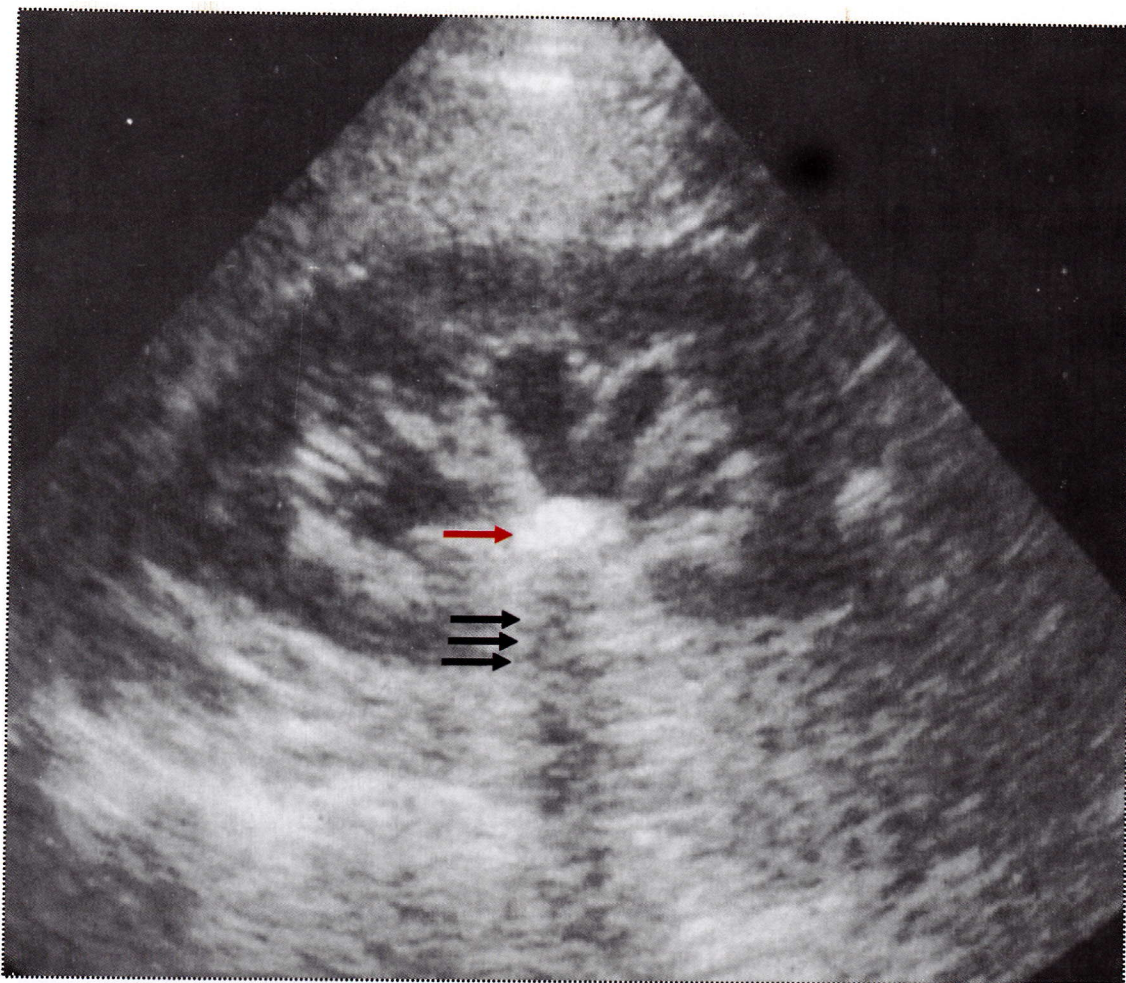
1. Bladder visualization indicates that urethral injury does not include the whole urethral circumference. T
2. Rupture posterior urethra usually results from fracture pelvis. T
3. This patient may present with hematuria. T
4. Urethral stricture is the most common complication. T
5. Urgent catheterization is indicated. F

Stones

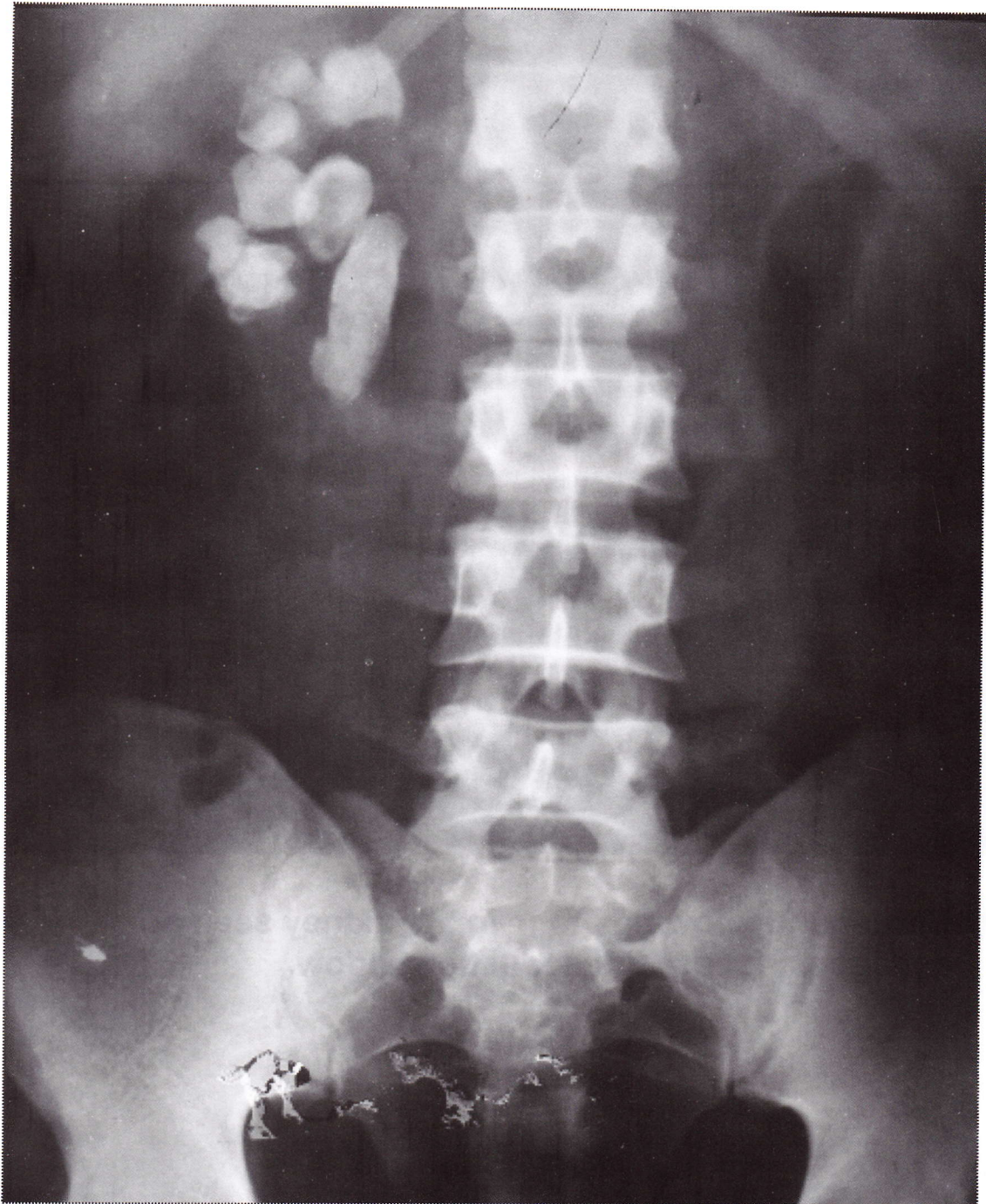
Kidney Stones



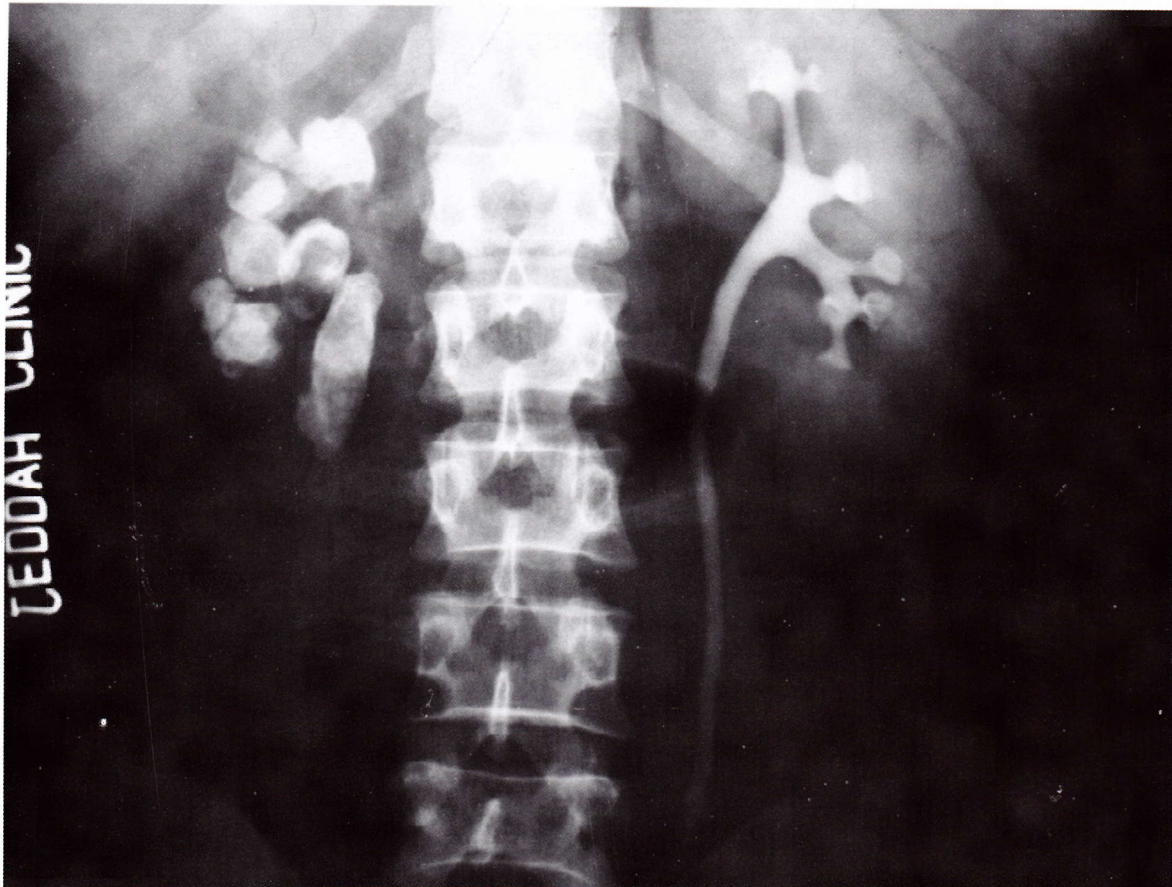
■ PUT showing radio opaque stone in left kidney.



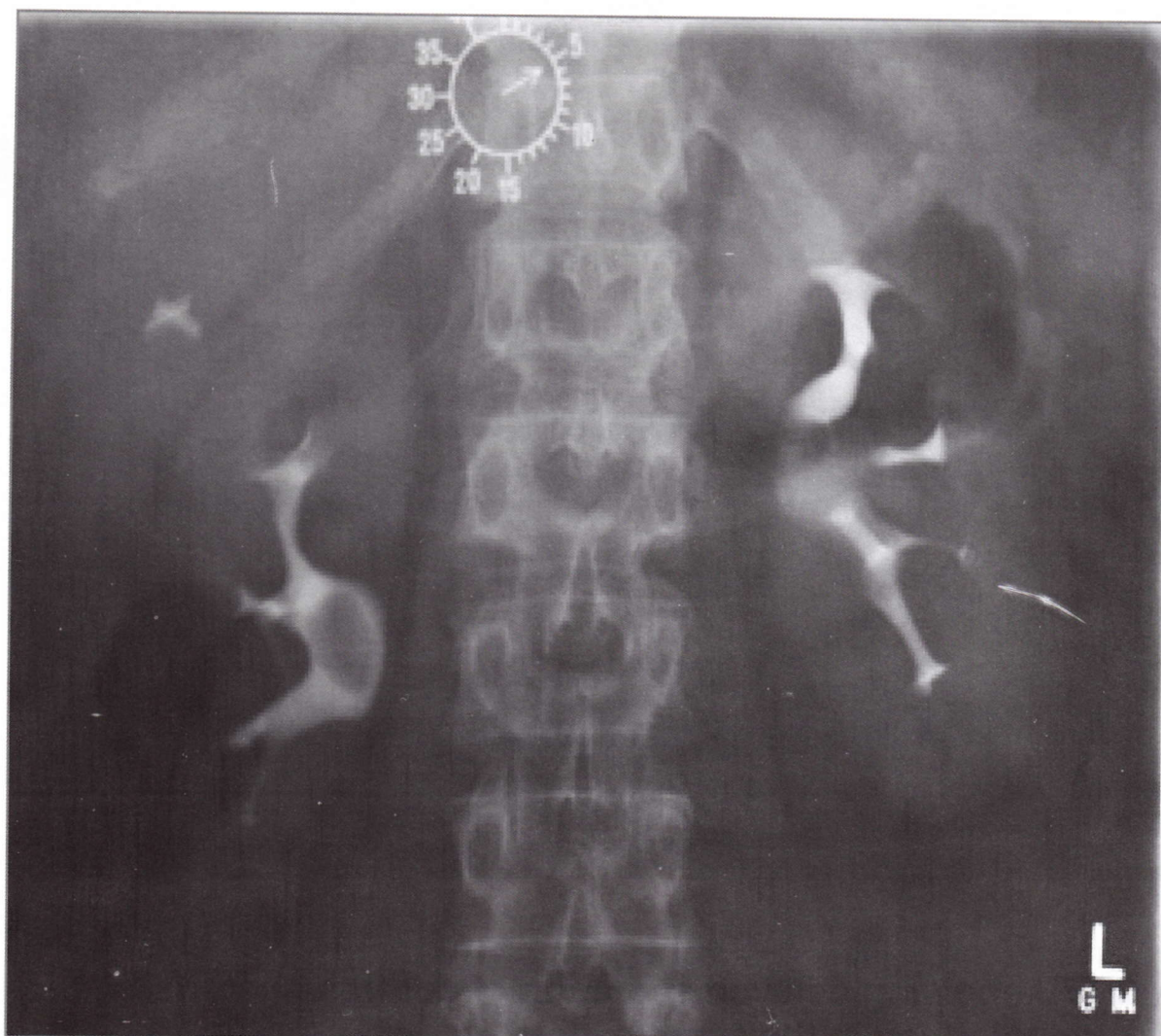
- Ultrasound showing **stone** in the kidney seen as echogenic focus with **acoustic shadow**.



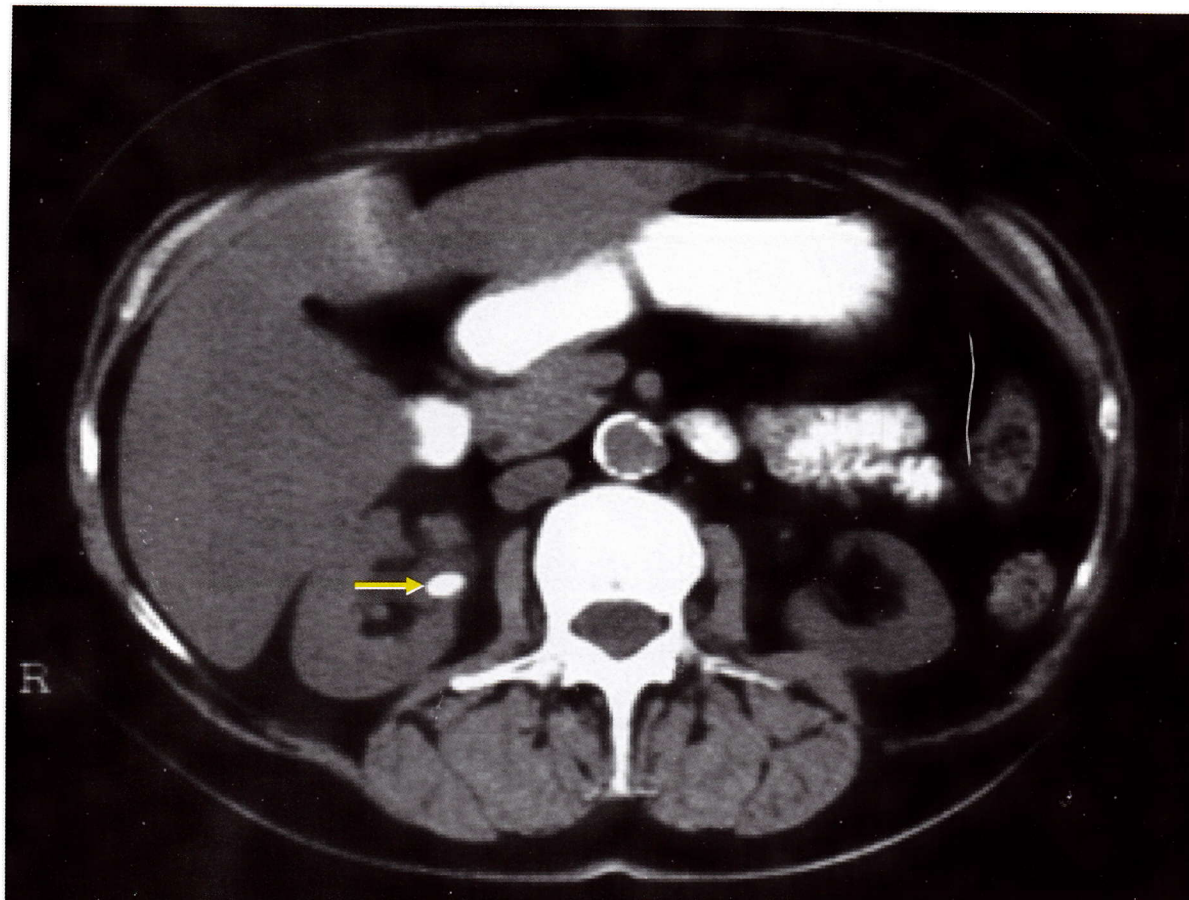
■ PUT showing stag horn stone in the right kidney.



- IVU showing delayed secretion of contrast material in the right kidney in the same patient.



■ IVU showing smooth filling defect in the right renal pelvis possibly radiolucent stone.



■ CT scan showing stone in the right kidney.

Questions

1. About 5% of renal stones are radiolucent. T
2. CT scan is important to differentiate radiolucent stone from transitional cell carcinoma. T
3. Hyperthyroidism is important cause of multiple urinary stones. T
4. Loin pain is a common clinical presentation for this condition. T
5. ESWL can be a line of treatment. T

Ureteric Stones

- Seen opposite either transverse lumbar vertebrae, sacroiliac joint or ischeal spine.



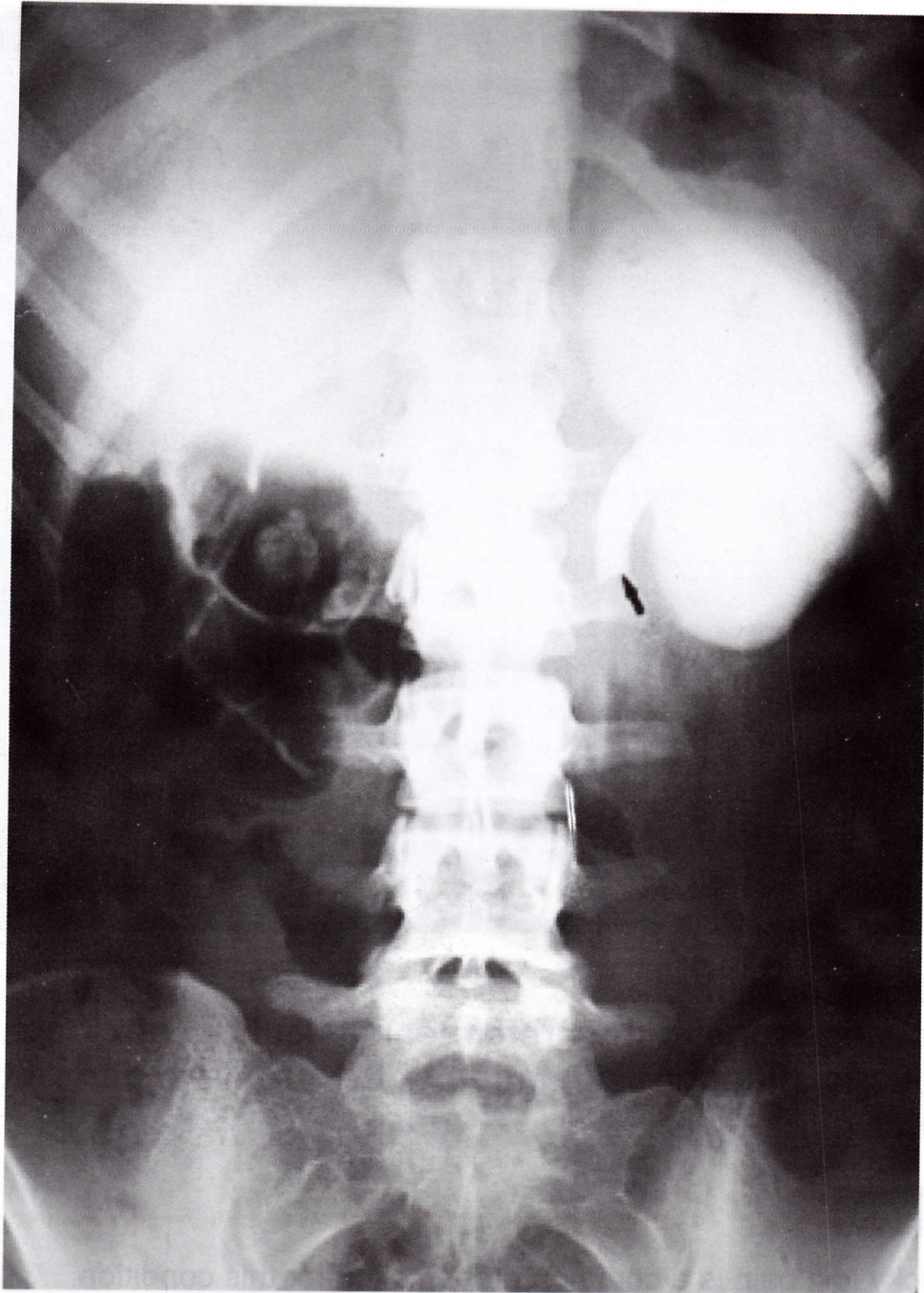
- **PUT** showing stone in the lower left ureter.



■ **IVU** of the same patient showing hydronephrosis of the left kidney.



■ PUT showing stone in the left ureter.



- **IVU late film of the same patient showing delay in passage of contrast material from the left kidney, dilatation of the collecting system & retention of the contrast material in the renal parenchyma indicating obstruction of the ureter.**



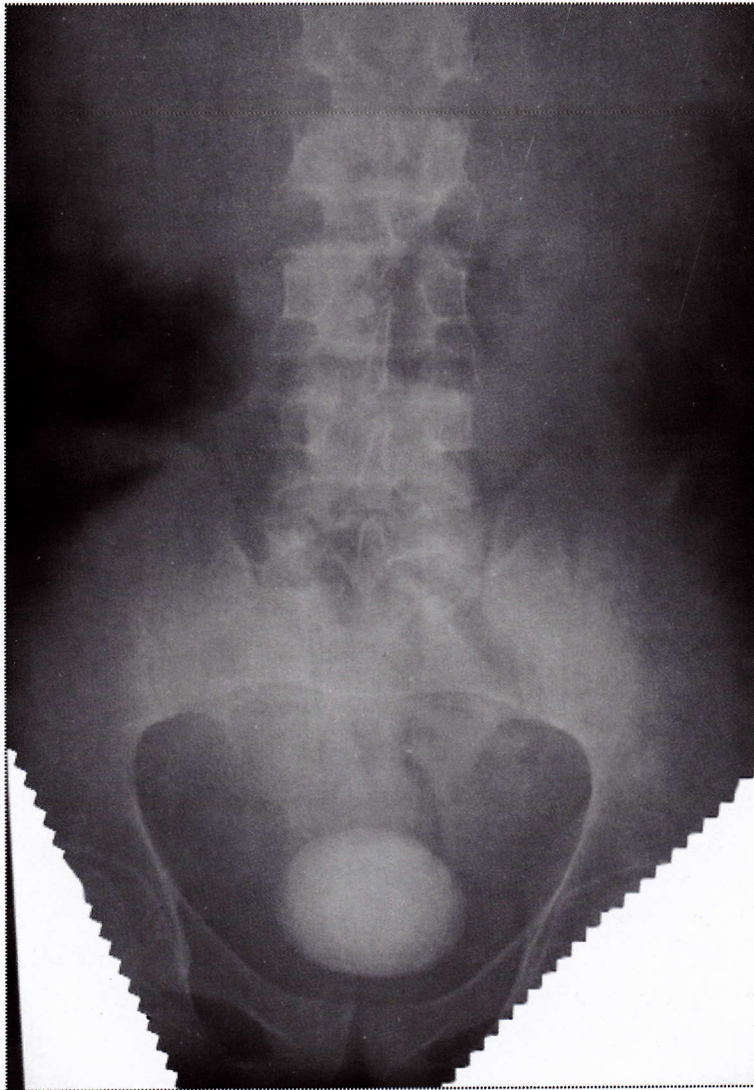
■ Ultrasonography

- Showing stone in the ureter seen as echogenic focus with acoustic shadow & dilatation of the proximal part of the ureter.

Questions

1. Colicky loin pain is a common presentation for this condition. T
2. Acute appendicitis is a differential diagnosis for right side stone ureter. T
3. Conservative treatment is tried with stones less than 0.5 cm. T

Urinary Bladder Stones



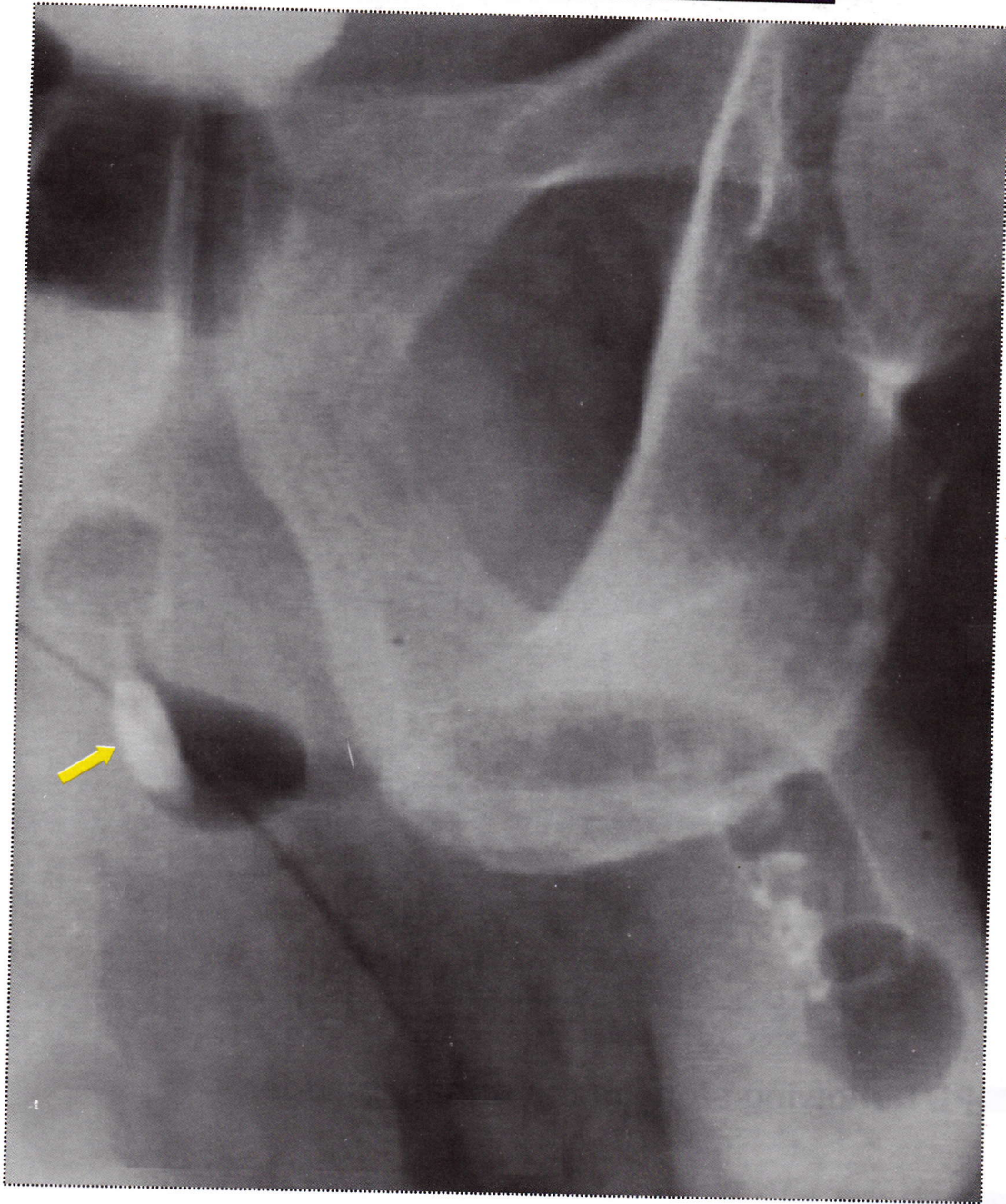
■ PUT showing stone in the urinary bladder.

Questions

1. This patient can present with terminal hematuria.
2. Frequency & dysuria are common clinical presentations for this condition.
3. Cystolithotomy is a line of treatment for this condition.

T
T
T

Urethral Stone



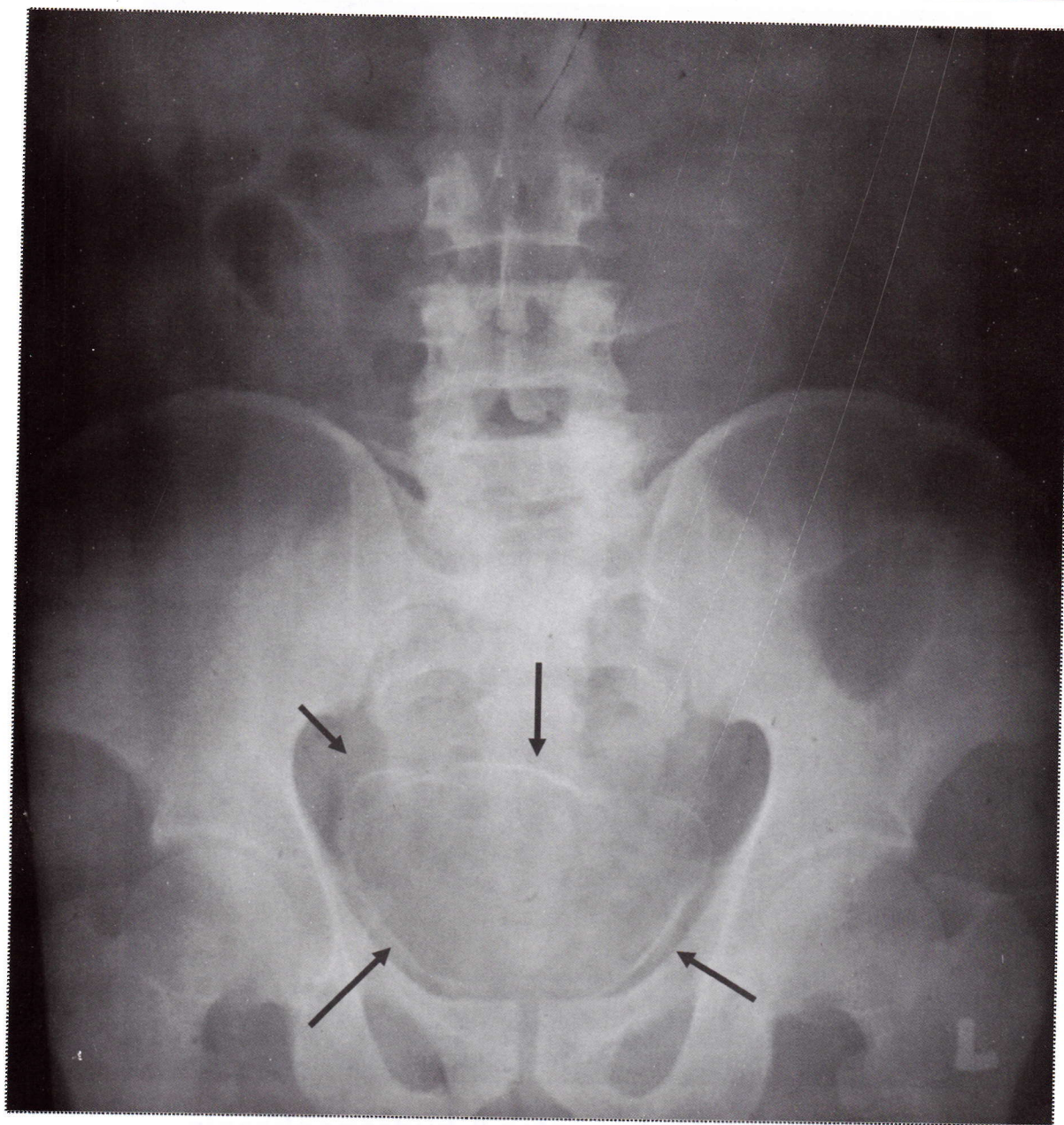
■ X-ray showing stone in the urethra.

Hydroureter & Hydronephrosis

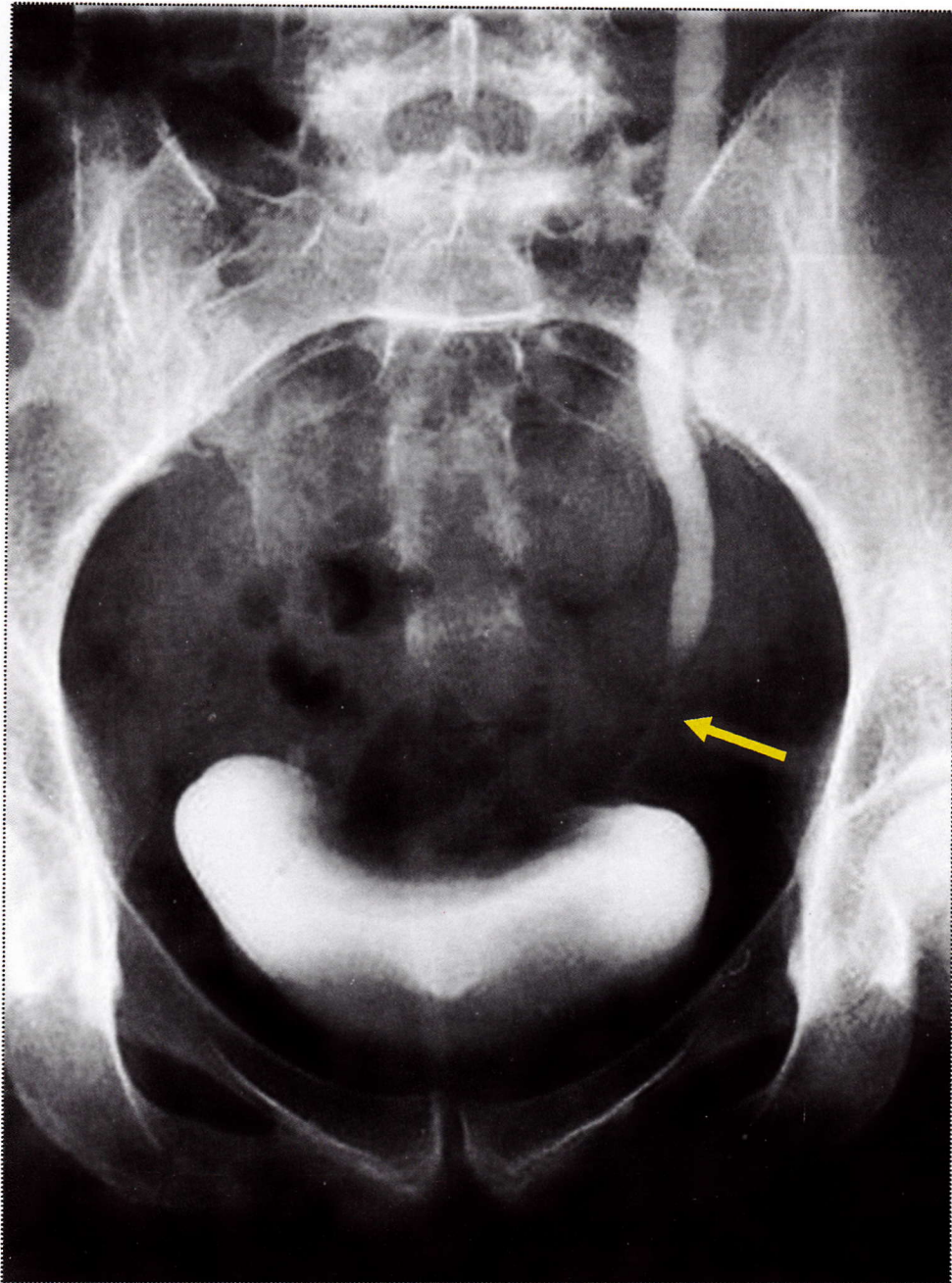


- IVU showing left hydroureter & hydronephrosis.
- Hydronephrosis seen as dilated pelvi-calyceal system: loss of waist, flattening, clubbing then ballooning of minor calyces.
- Hydroureter seen as continuity contrast material inside the ureter then dilatation of the ureter.

Bilharziasis



■ Urinary bladder calcification plain x-ray.



■ **Stricture of the lower end of the ureter.**

Questions

1. This condition is caused by schistosoma hematobium. T
2. Burning micturation is a common clinical presentation for this condition. T
3. This condition is premalignant. T
4. Curettage & litholapaxy is the treatment of choice for urinary bladder calcification. T

Tumors

Senile Enlargement of Prostate (SEP)



■ **Seen as smooth basal filling defect of the urinary bladder in the IVU.**

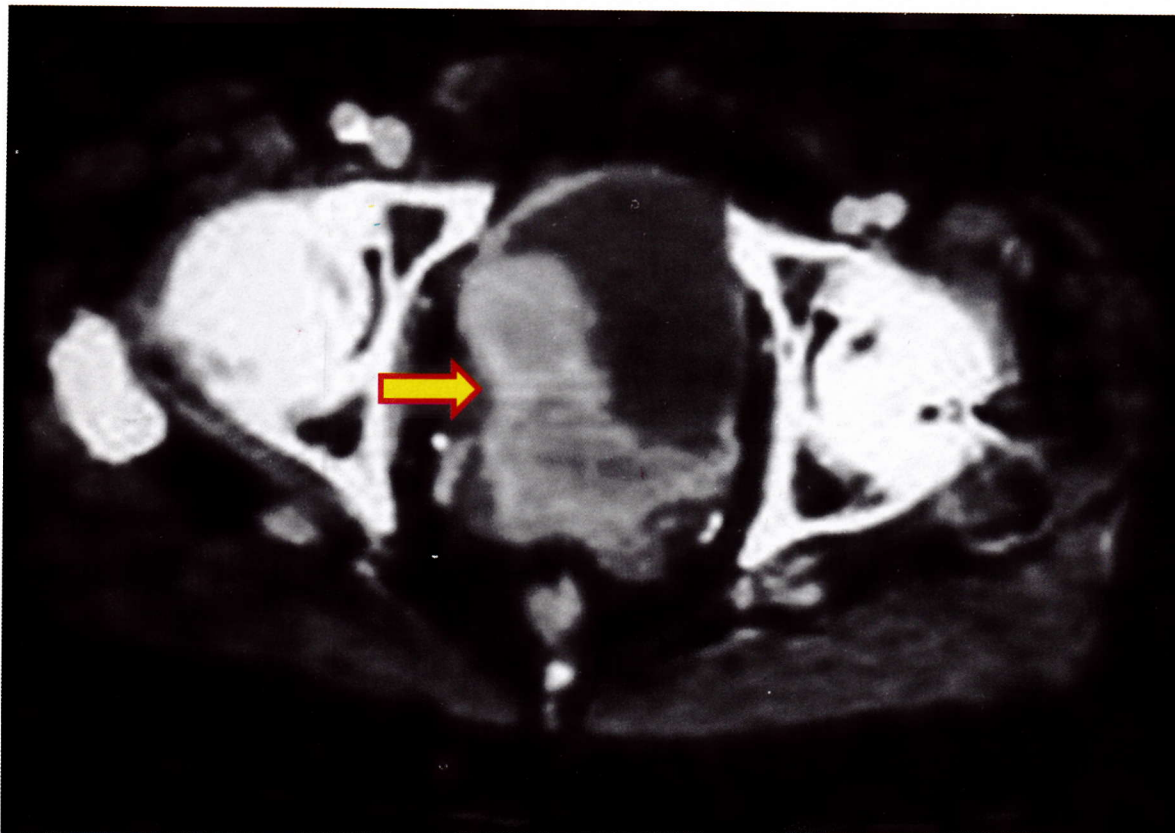
Questions

1. Acute urinary retention is a possible clinical presentation. **T**
2. Cystography may show chronic urinary retention & diverticulum formation in the bladder secondary to SEP. **T**
3. Neglected cases may be complicated by renal failure. **T**
4. Conservative medical treatment is contraindicated once acute retention occurred. **F**
5. TURP is the best line of surgical treatment. **T**

Cancer Bladder



- IVU seen as irregular filling defect in the urinary bladder with or without back pressure changes in the kidneys & ureters .



■ CT scan showing irregular filling defect arising from the bladder wall.

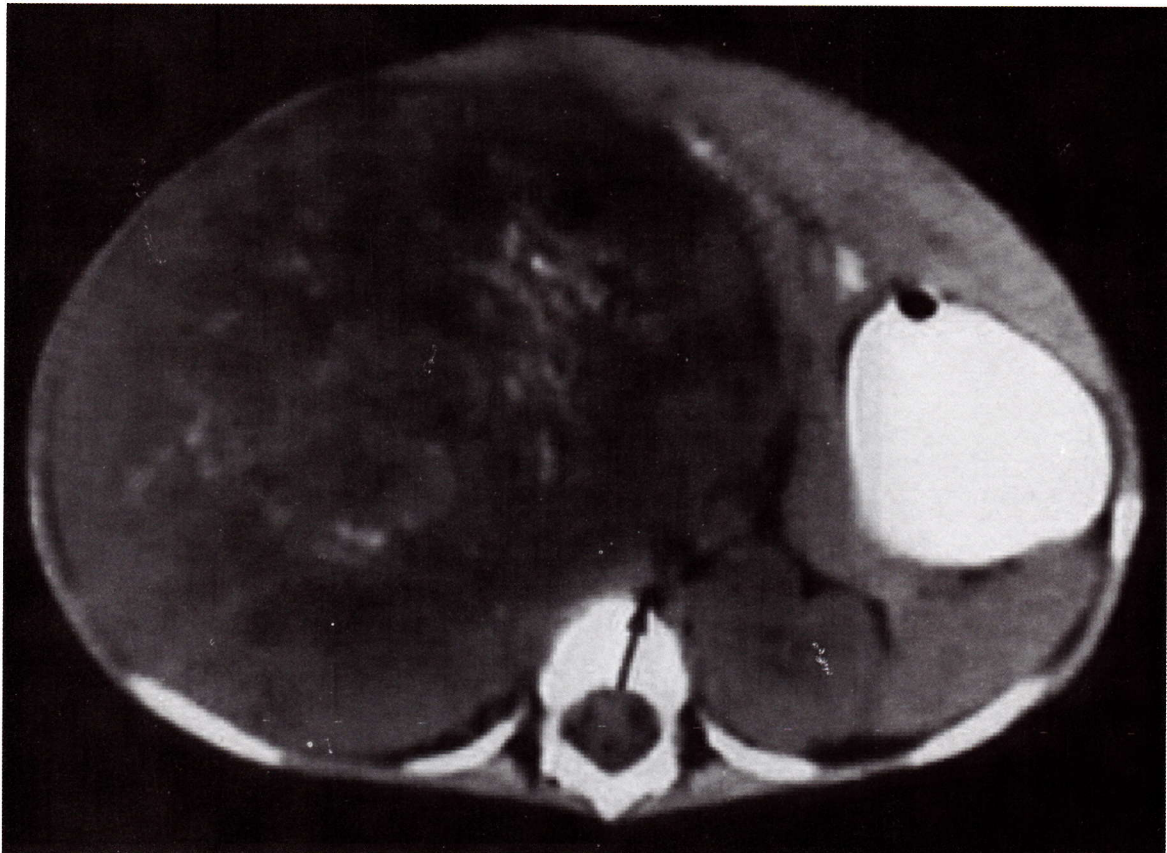
Questions

1. This condition may be presented clinically with hematuria.
2. Bilharziasis is a major predisposing factor for this condition.
3. This condition is common with young age.
4. Cystoscopy & biopsy is indicated for this condition.

T
T
F
T

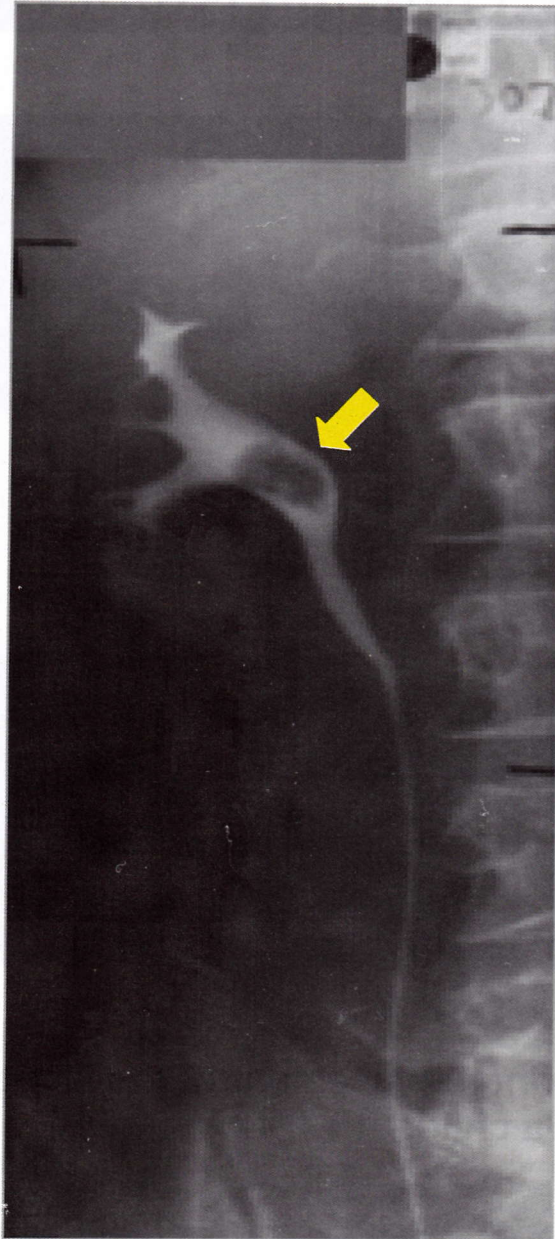
Renal Tumors

Wilm's Tumor (Nephroblastoma)



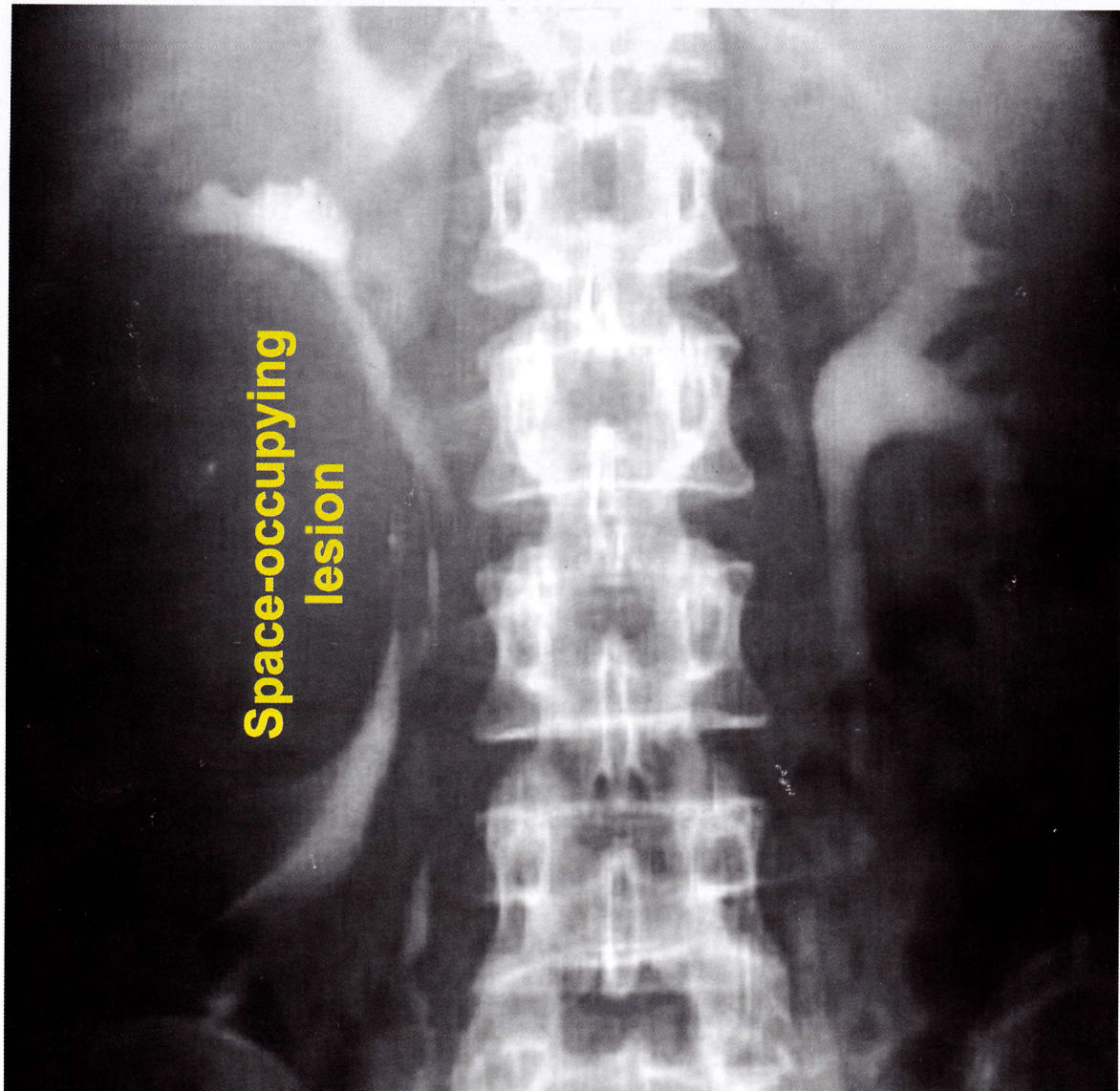
- CT scan showing replacement of the kidney by a huge solid mass in a child.

Transitional Cell Carcinoma of the Renal Pelvis

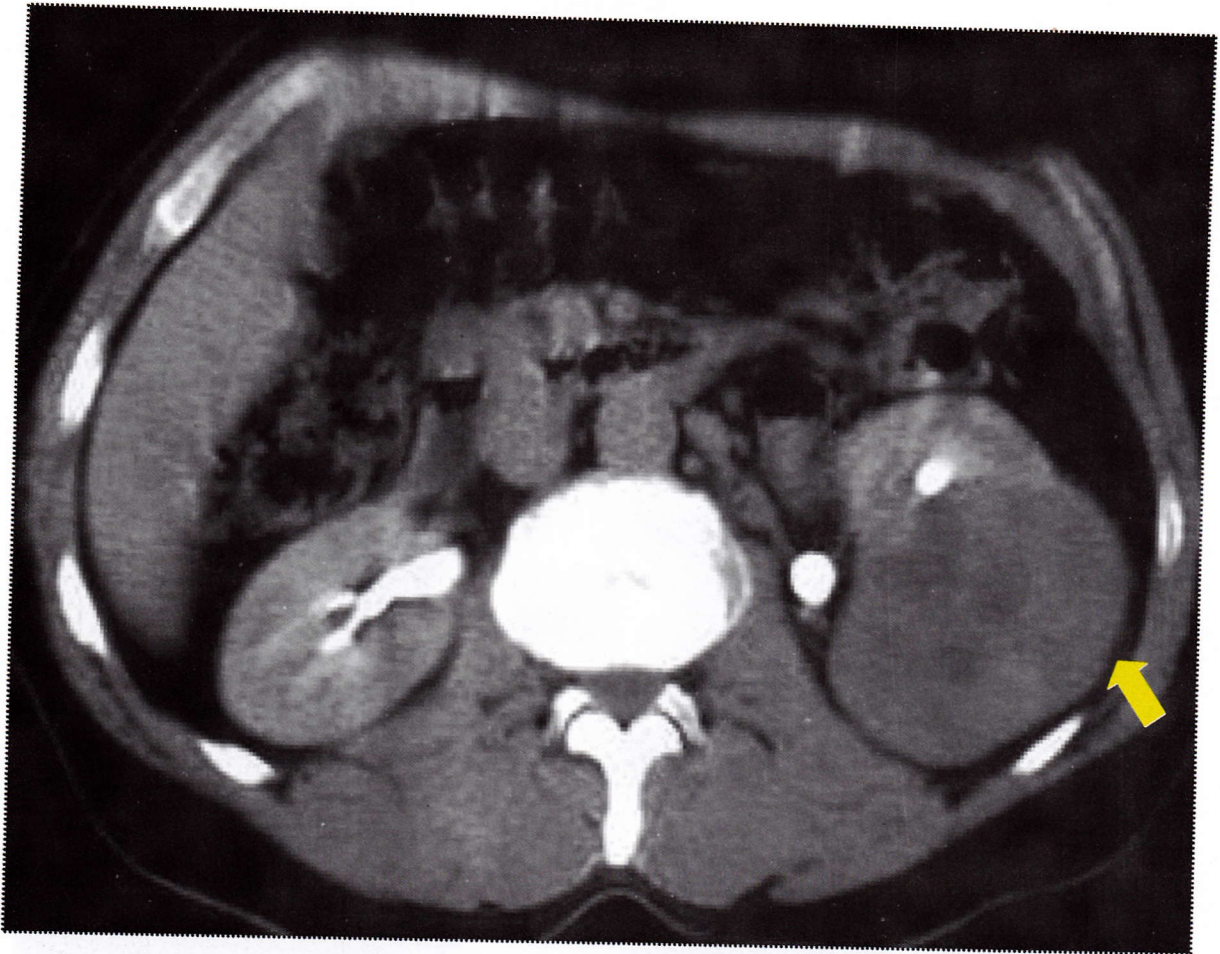


- IVP seen as irregular filling defect in the renal pelvis for differential diagnosis.
- It may be multicentric with other foci in the renal pelvis, ureter & urinary bladder.

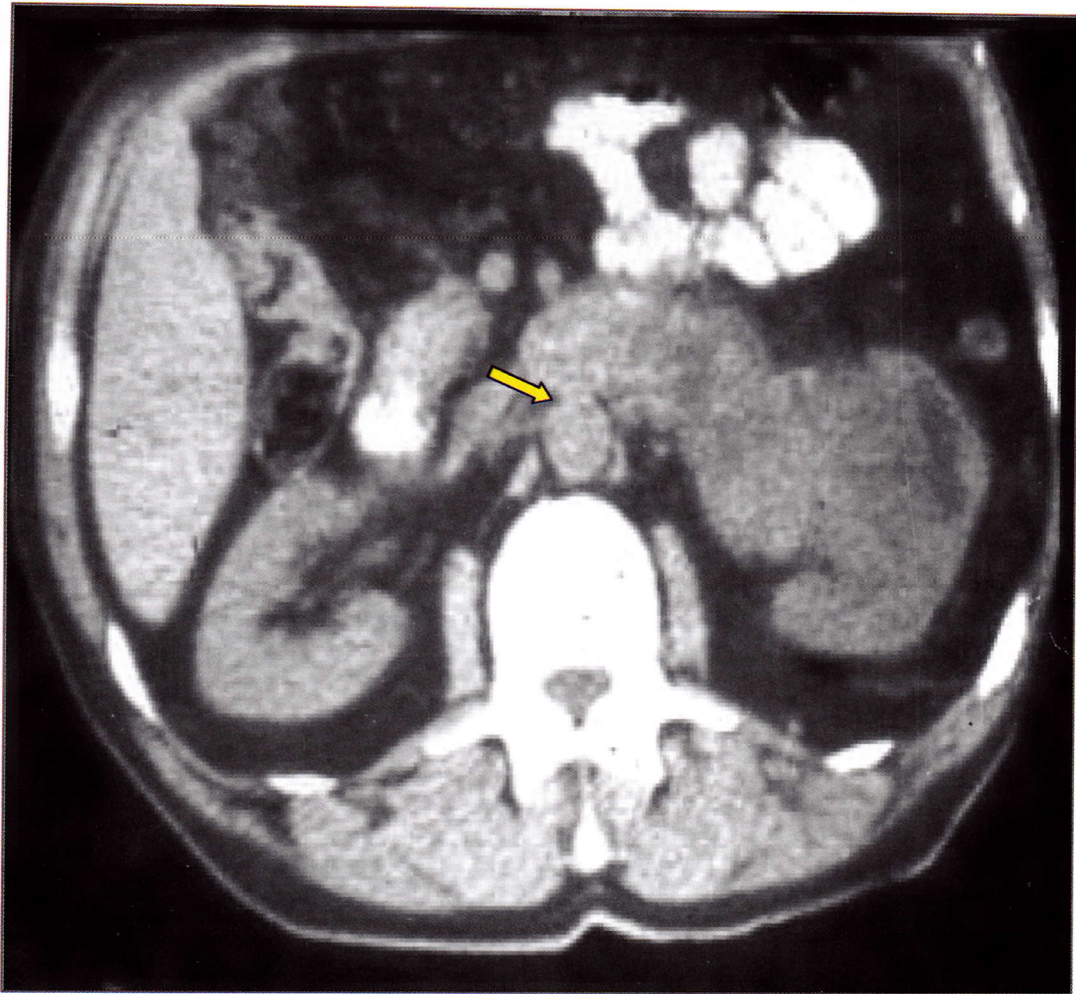
Renal Cell Carcinoma (Hypernephroma)



- IVU showing a space occupying lesion causing distortion of pelvi-calyceal system in the form of stretching & amputation of calyces.



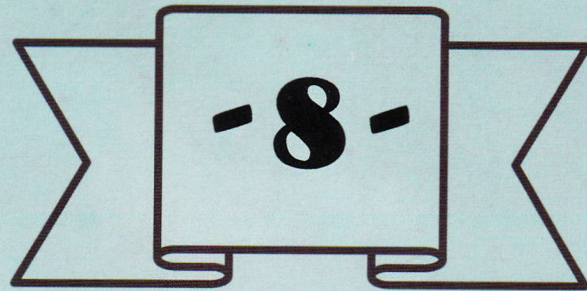
■ CT showing soft tissue mass in the kidney & infiltrating surrounding structures.



■ **Invasion of the renal vein may be seen giving finger in glove appearance.**

Questions

1. U/S is useful to differentiate solid & cystic space occupying lesions in IVU. T
2. Painless hematuria is the most common presentation of this condition. T
3. This condition may be complicated by secondary varicocele. T
4. Nephrectomy is the best line of treatment of this condition. T



Orthopedic Radiology

Upper Limb

Fracture Clavicle



Questions

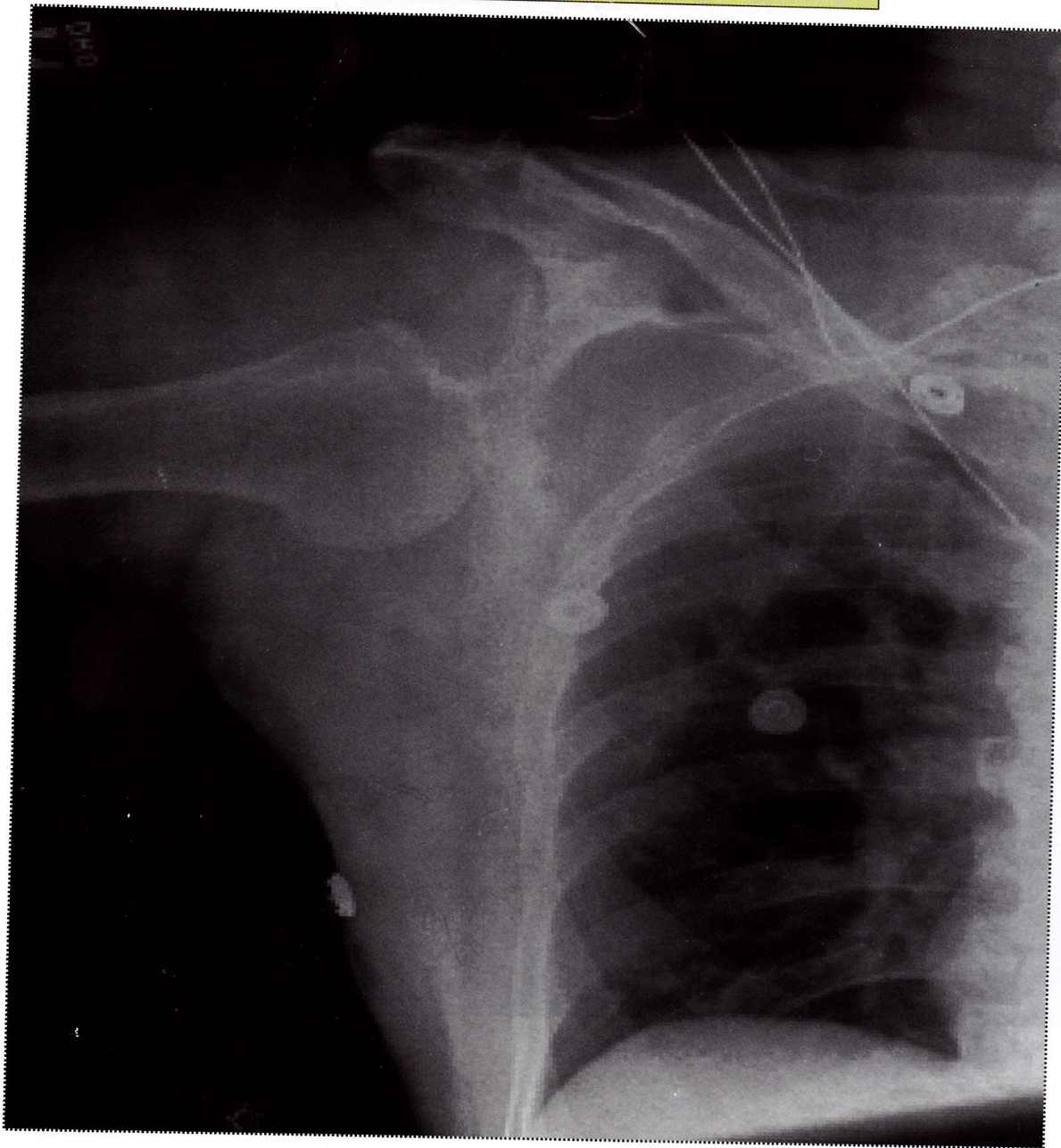
1. This fracture occurs most commonly due to fall on outstretched hand. **T**
2. Malunion is the common complication for this fracture. **T**
3. Open reduction & internal fixation is the main line of treatment. **F**

Shoulder Dislocation

A. Anterior Shoulder Dislocation



B. Inferior Shoulder Dislocation



Questions

1. This is the most common joint to be dislocated in the body. **T**
2. Patients usually present with locking of shoulder movements & loss of shoulder contour. **T**
3. Closed reduction & fixation in adduction is the main line of treatment. **T**

Fracture Humerus

A. Fracture Neck Of Humerus



Questions

1. Axillary nerve injury is a common complication.
2. Closed reduction & external fixation is the treatment of choice.

T
F

B. Fracture Shaft Of Humerus



Questions

1. Radial nerve injury is commonly injured in spiral groove with this fracture.
2. Closed reduction & external fixation is the treatment of choice.

T
T

C. Supra-Condylar Fracture



Questions

1. This type of fractures is common in children.
2. Vascular injury is a common complication with this fracture.
3. Closed reduction & internal fixation is the treatment of choice.

T
T
T

Elbow Dislocation & Fractures

A. Posterior Elbow Dislocation



Questions

1. This condition occurs due to fall on outstretched hand. **T**
2. Disruption of the joint line between olecranon & condyles is present. **T**
3. Open reduction & internal fixation is the best line of treatment. **F**

**B. Fracture Medial
Epicondyle**



C. Fracture Olecranon



Fracture Both Bones (Radius & Ulna)



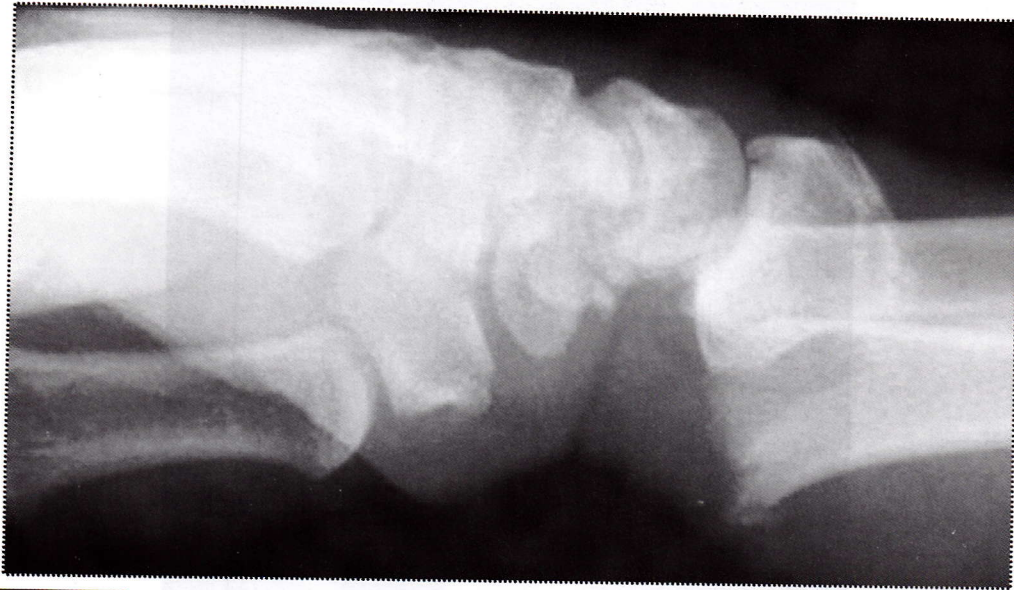
Questions

1. Cross union is a possible complication.
2. Open reduction & internal fixation is the main line of treatment.

T
T

Fractures of The Wrist

Colle's Fracture



Questions

1. This fracture is common in osteoporotic patients.
2. Distal segment is displaced backwards, laterally & upwards.
3. Sudeck's atrophy may complicate this condition.

T
T
T

Smith Fracture



Fracture Scaphoid Bone



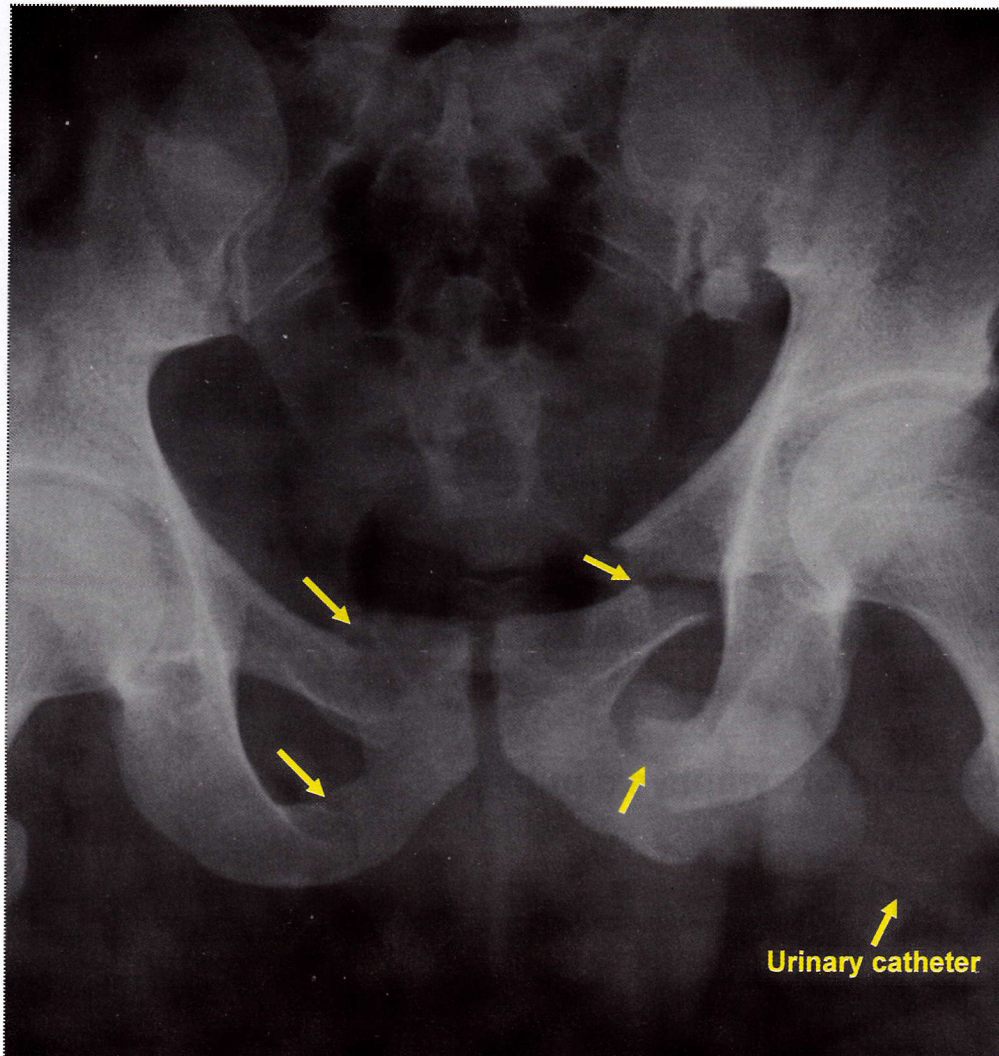
**Fracture 5th Metacarpal
Bone**



Lower Limb

Fracture Pelvis

A. Butterfly Fracture



➡ **Note:**

- Fracture of both upper & lower pubic rami.

B. Open book fracture



➔ **Note:**

- Separation of symphysis pubis.

Questions

1. Rupture bladder & rupture urethra must be excluded with this fracture. T
2. Severe blood loss is a common complication. T
3. Open reduction & internal fixation is the main line of treatment. T

Hip Dislocation

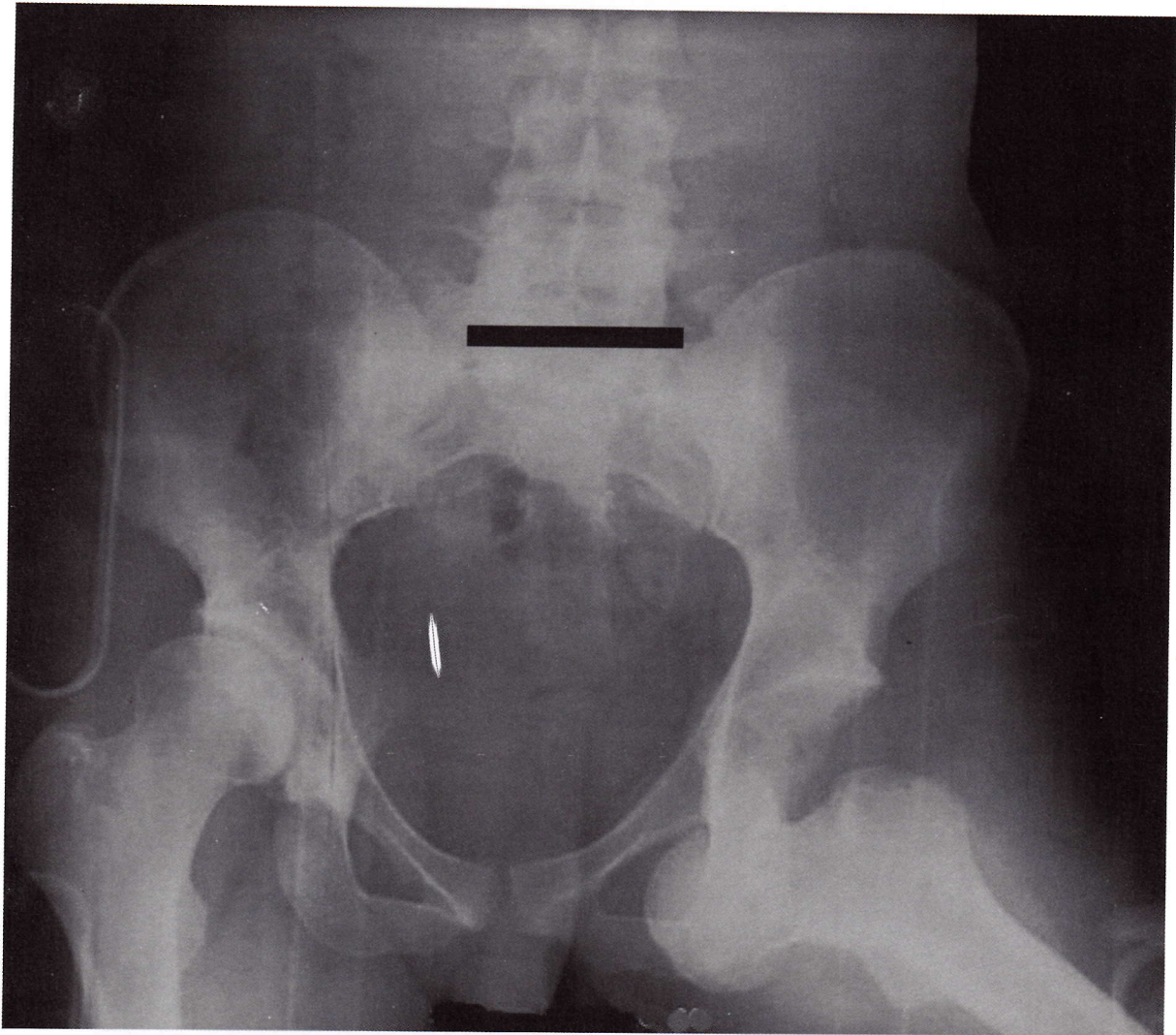
A. Posterior hip dislocation



Questions

1. This is the most common type of hip dislocation. T
2. Patients usually present with flexed, adducted & internally rotated hip. T
3. Sciatic nerve injury is a common complication. T

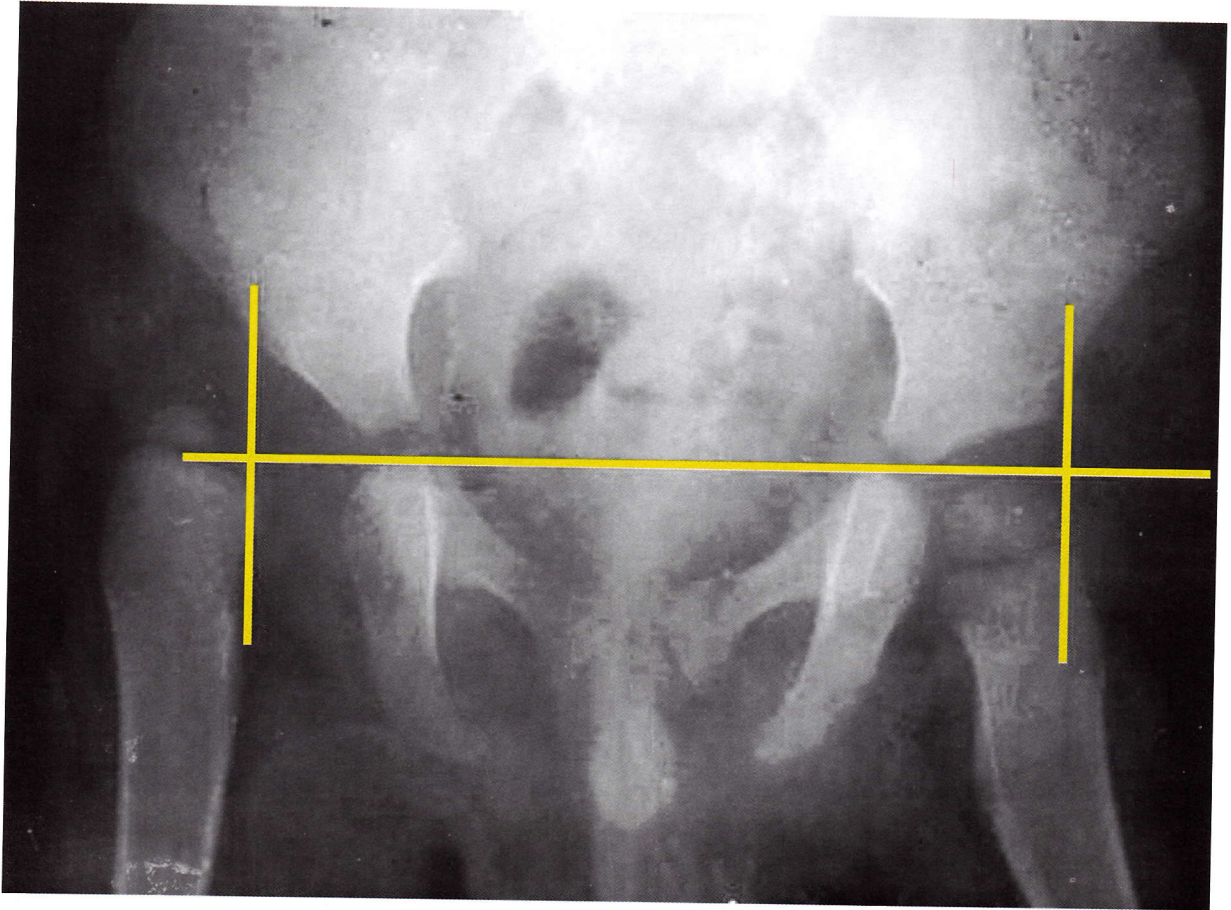
B. Anterior Hip Dislocation



C. Central Hip Dislocation



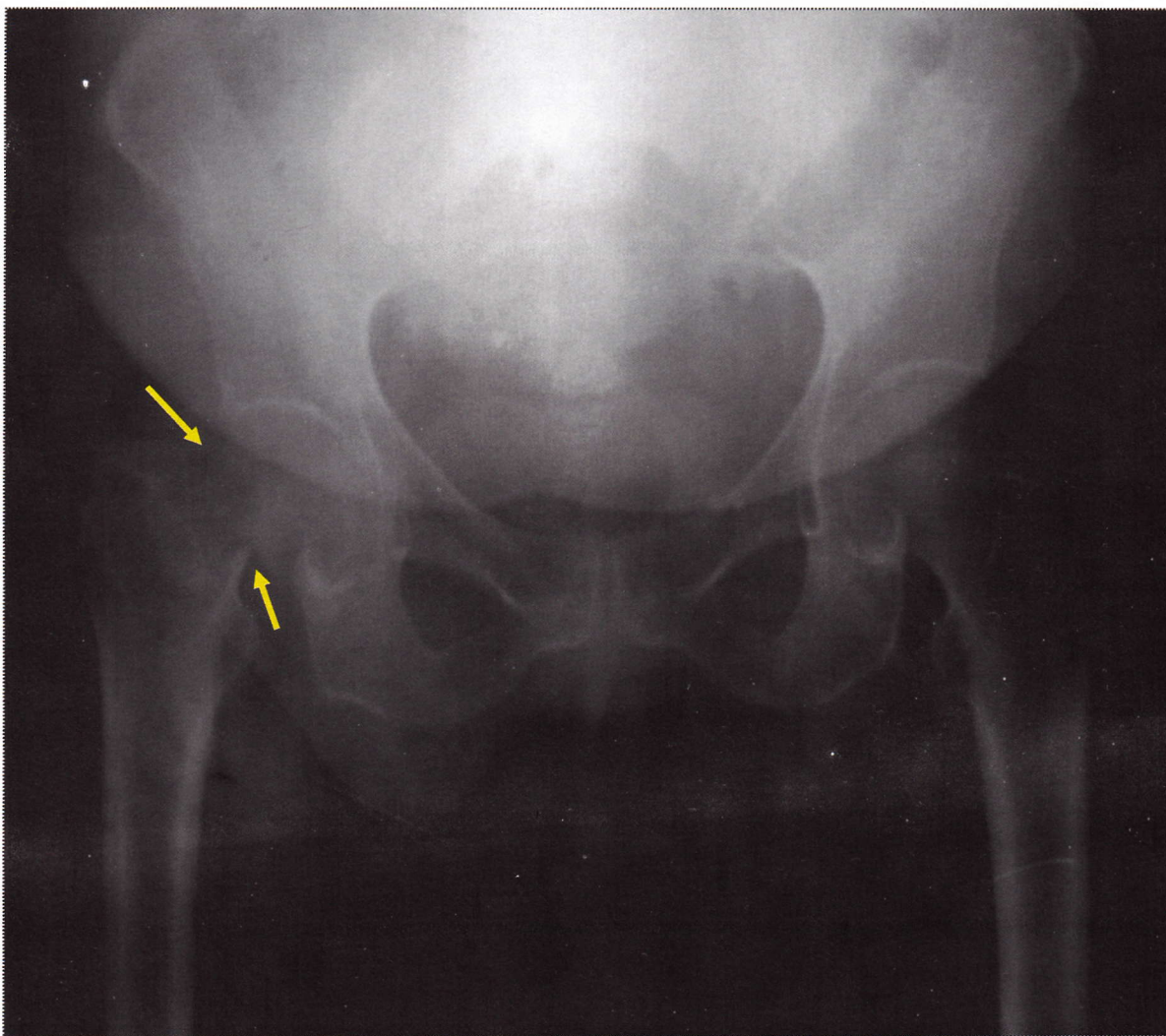
**D. Congenital Hip
Dislocation (Right Side)**



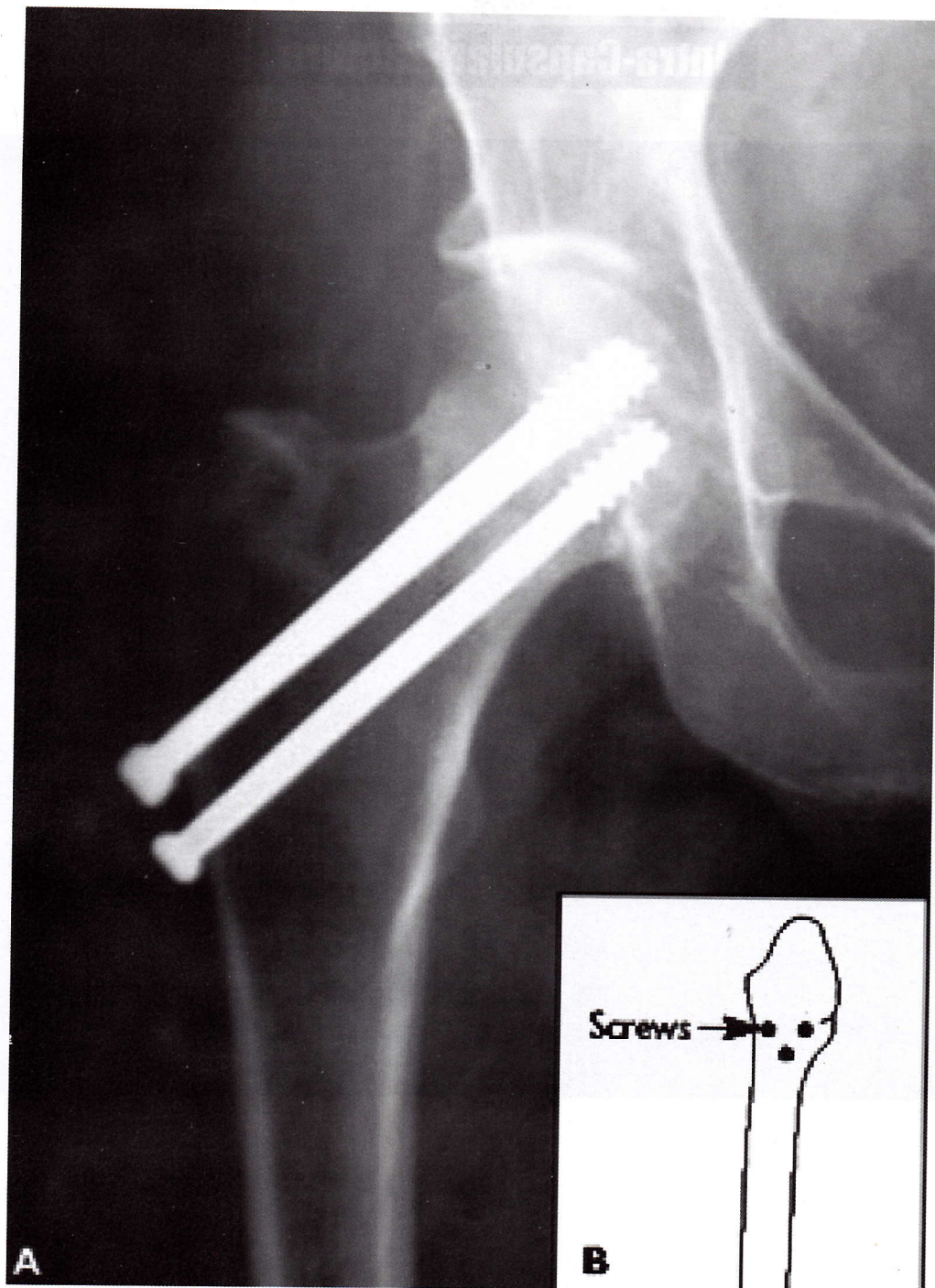
Fracture Femur

A. Fracture Neck Of Femur

Intra-Capsular Fracture



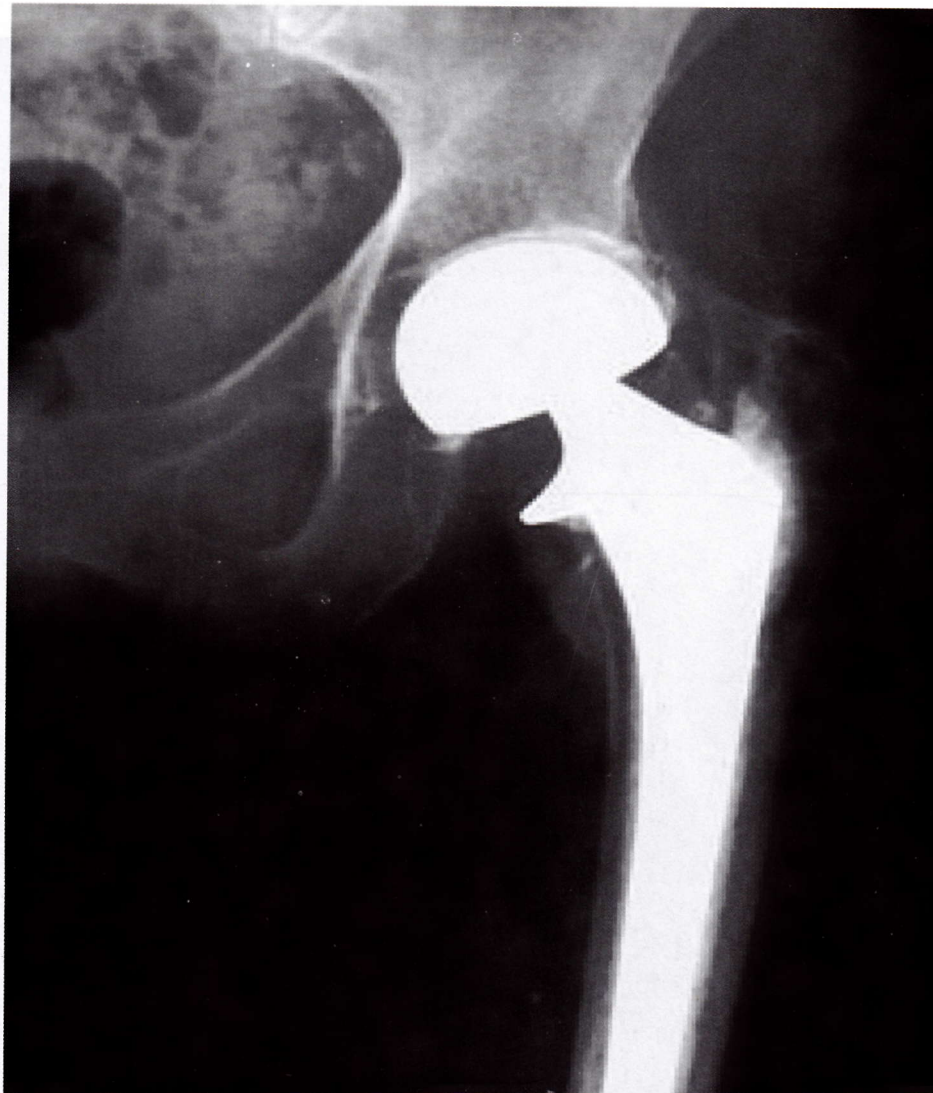
**Treatment by ORIF by
3 screws**



Avascular Necrosis of Head of Femur



Treatment by Hemi-Arthroplasty



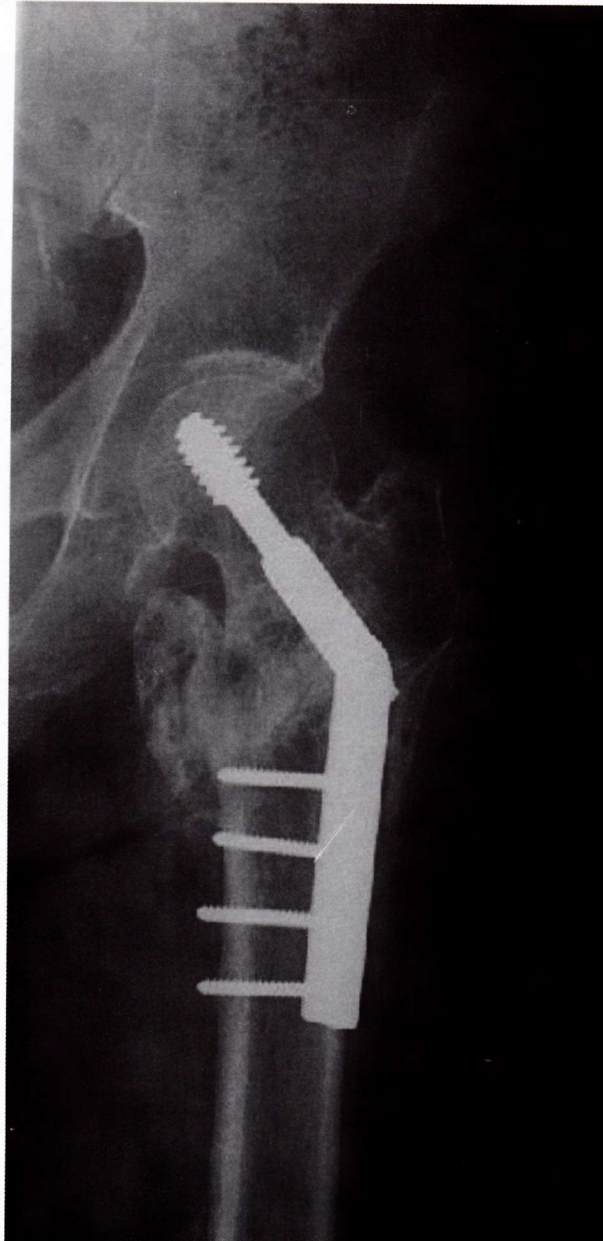
Questions

1. This fracture is common in young age. F
2. Avascular necrosis of the head of femur is a common complication of this fracture. T
3. Early surgical treatment is recommended for this fracture. T
4. This fracture carries a mortality of about 20%. T

Extra-Capsular Fracture



Treatment by ORIF by DHS



Questions

1. Avascular necrosis of head of femur is a complication of this fracture. **F**
2. This is a common site for pathological fractures. **T**
3. ORIF is the best line of treatment of this fracture. **T**

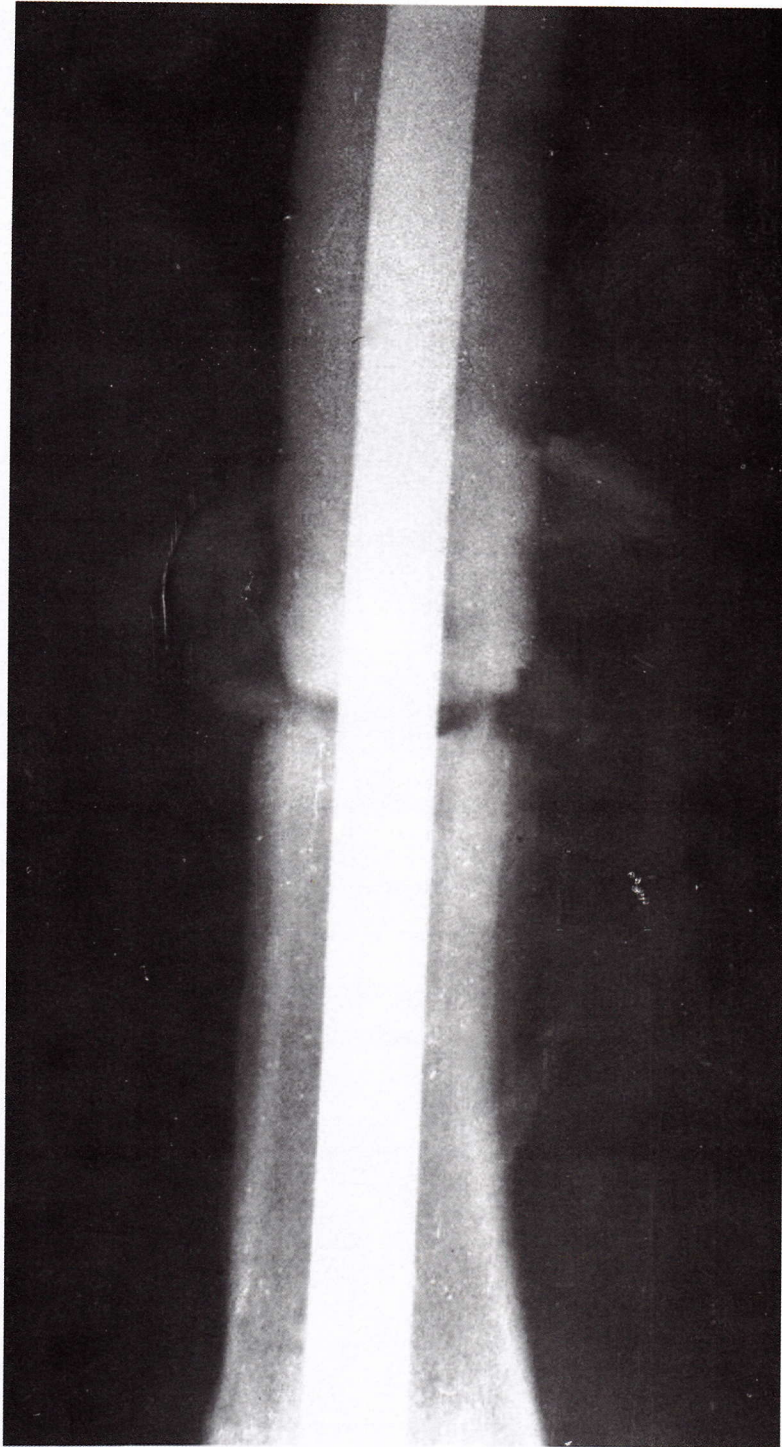
Slipped Upper Femoral Epiphysis



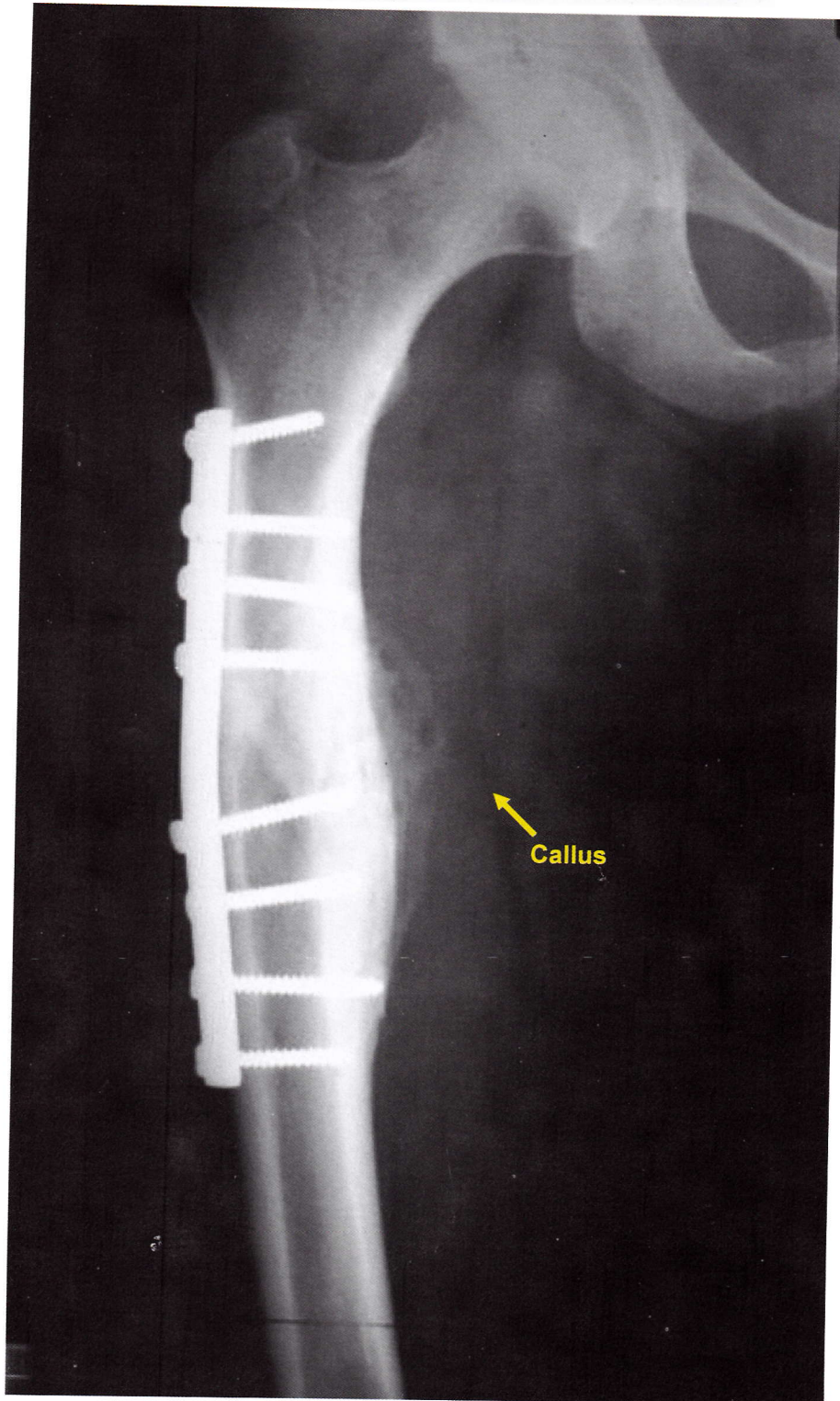
B. Fracture Shaft of Femur



Treatment by Intra-medullary Nail



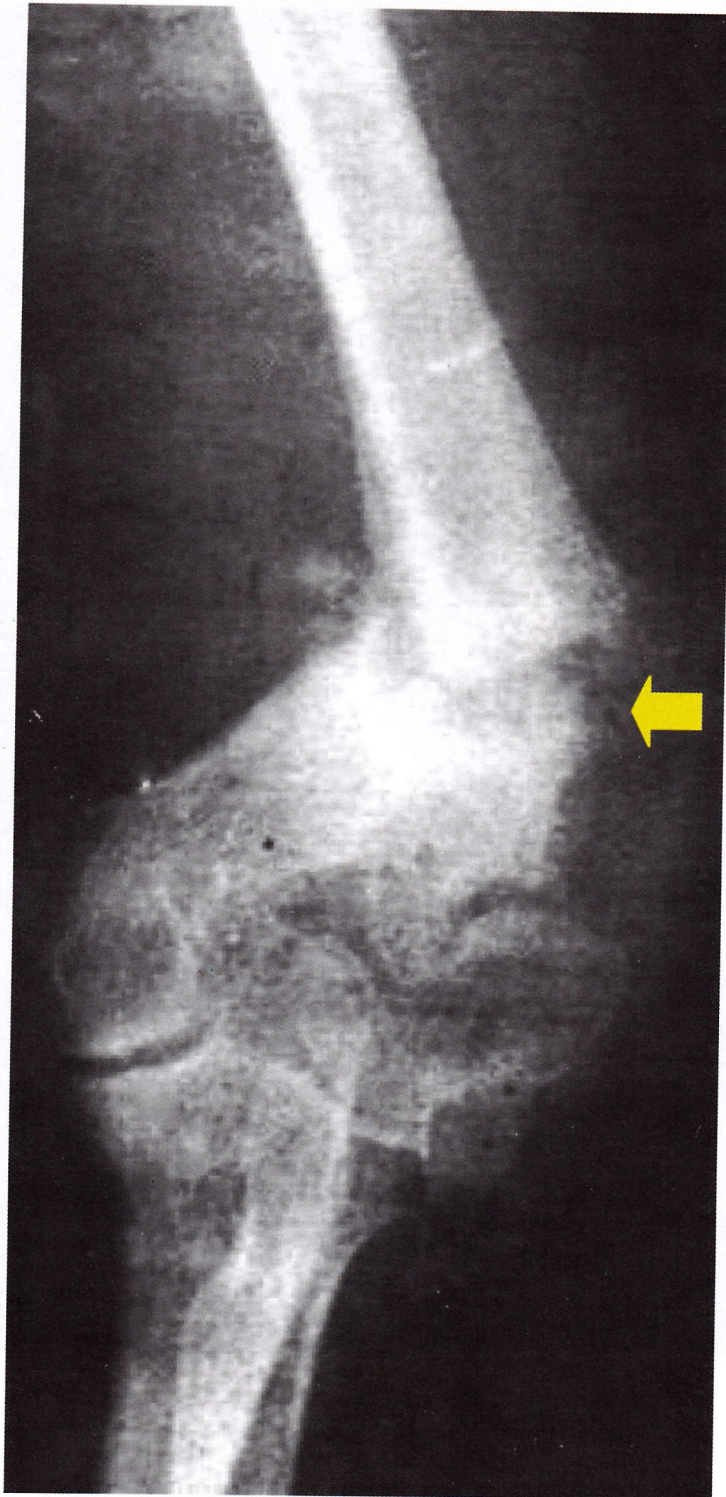
Treatment by plate & screws



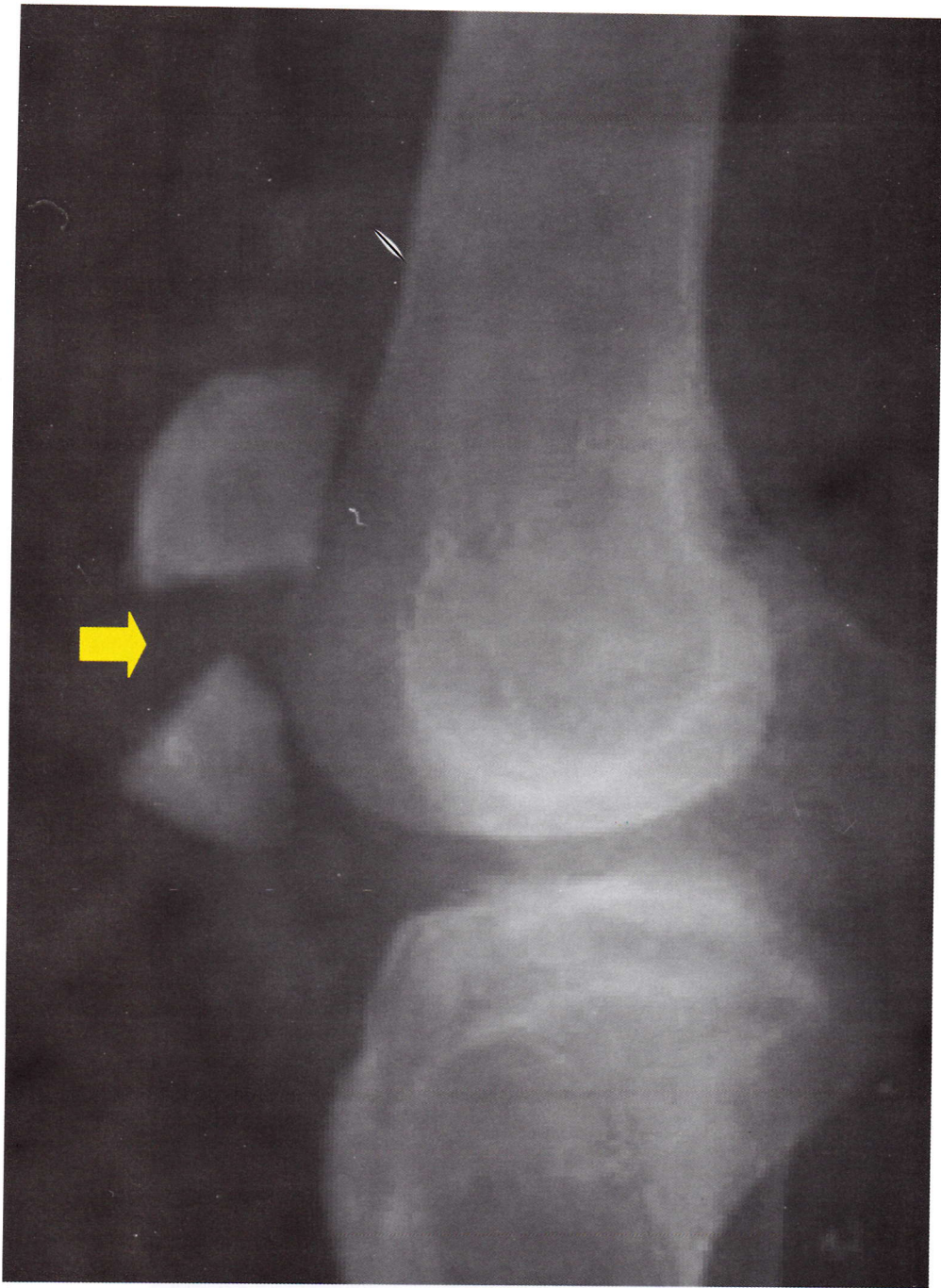
Treated by Thomas Splint



C.Supra-Condylar Fracture of Femur



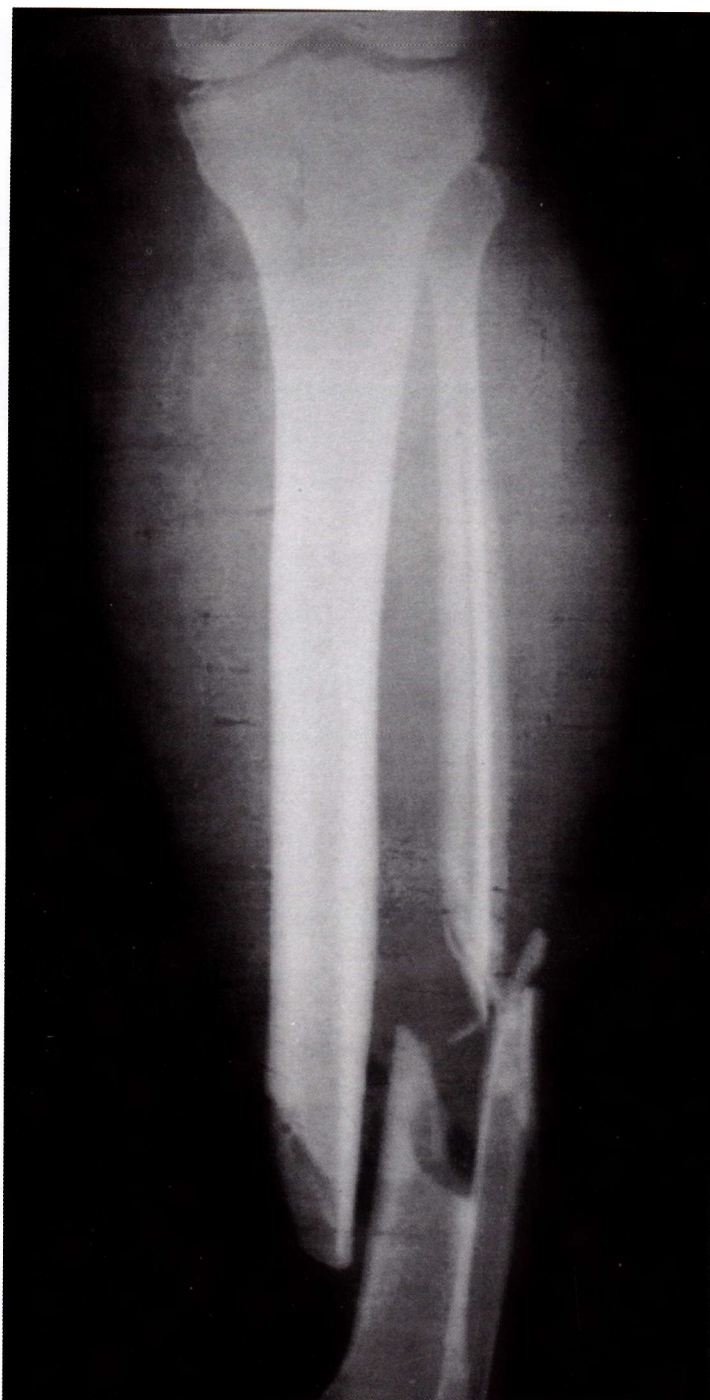
Fracture Patella



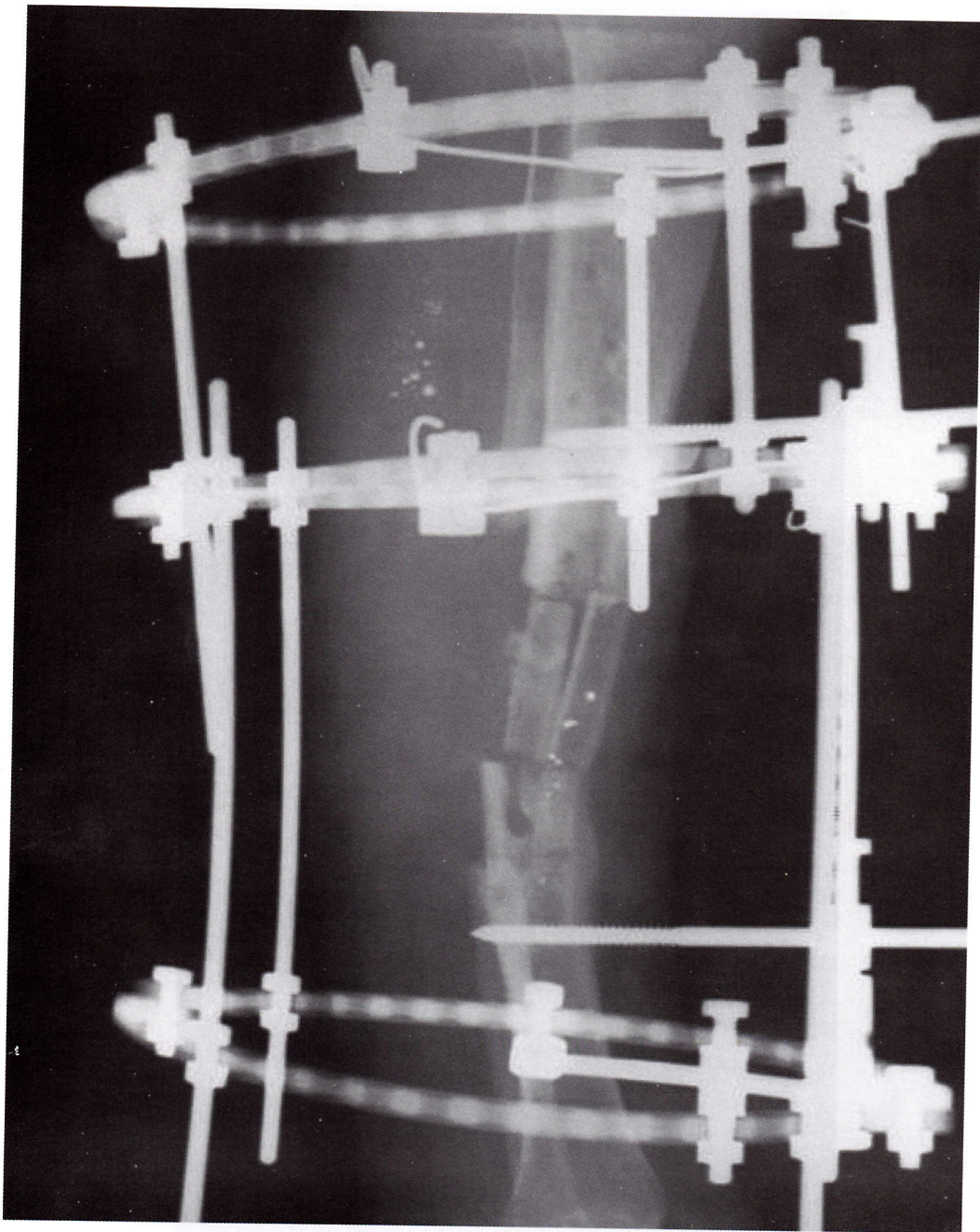
Anterior Knee Dislocation



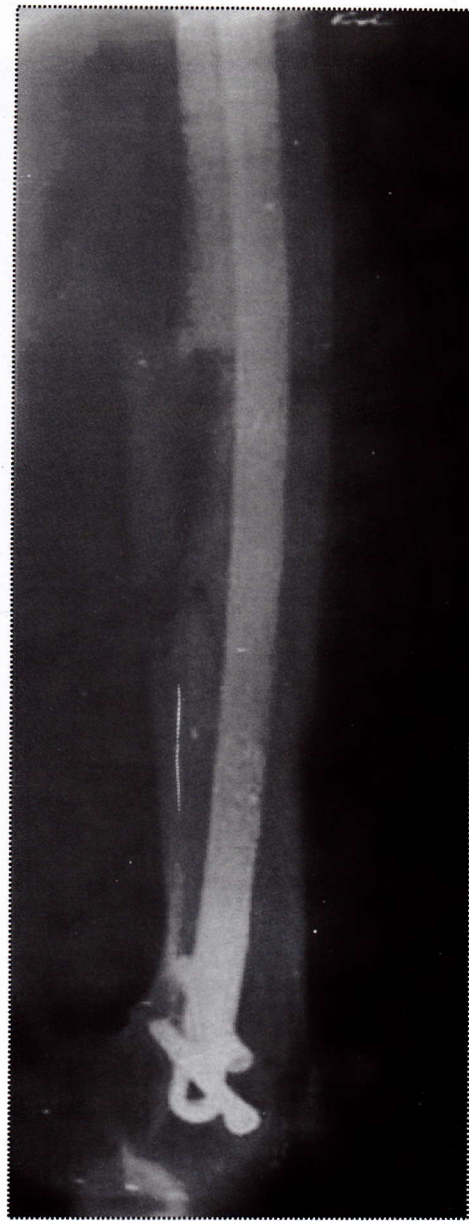
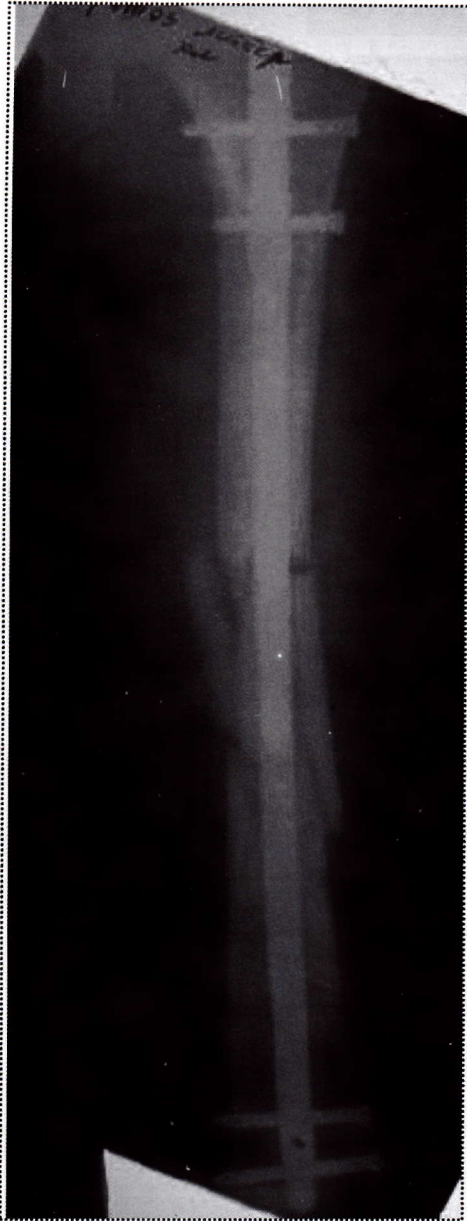
Fracture Both Bones (Tibia & Fibula)



Treatment by External Skeletal Fixation



Treatment by ORIF by Intra-Medullary Nail



Questions

1. This fracture is commonly a compound fracture.
2. Cross union is a possible complication.
3. Open fracture should be treated with internal fixation.

T
T
F

Pott's Fracture

1st Degree Fracture



- Fracture of one malleolus either medial or lateral malleolus.

2nd Degree Fracture



■ Fracture of both medial & lateral malleoli.

3rd Degree Fracture

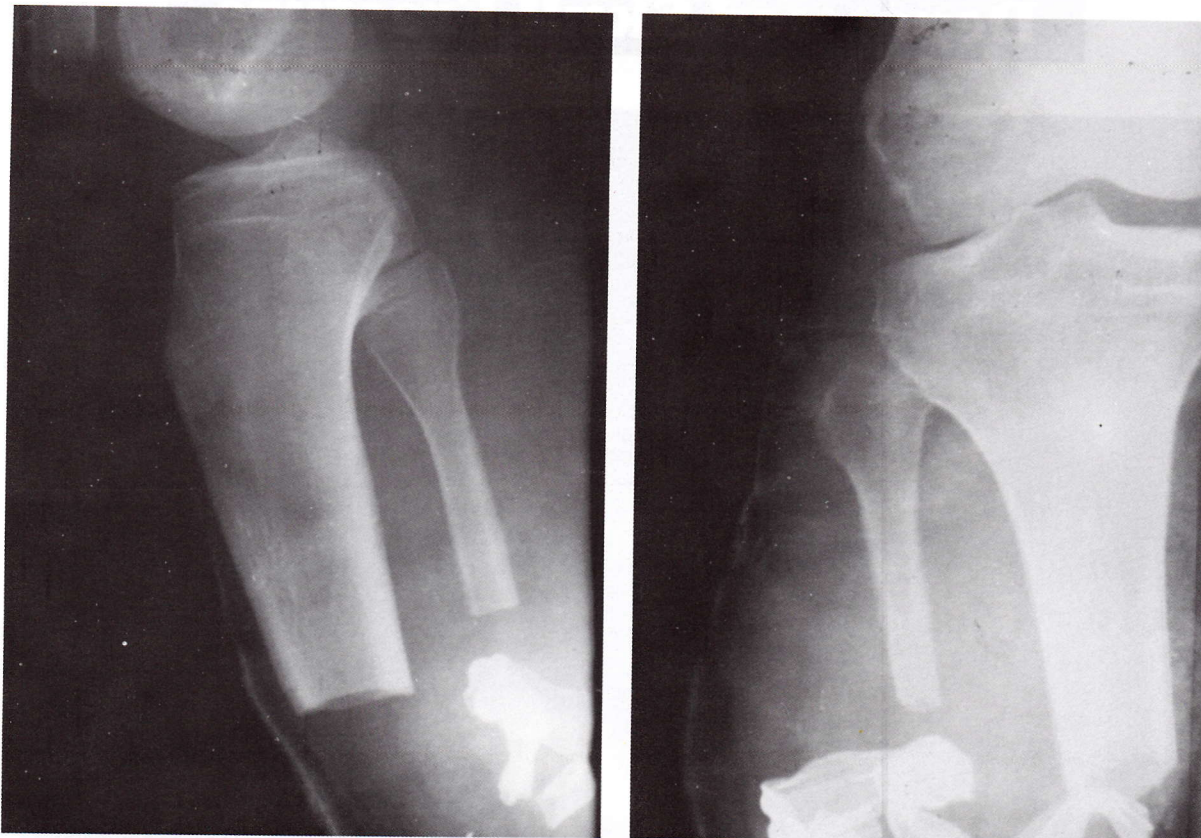


■ Fracture of medial, lateral malleoli & posterior tibial margin.

Questions

1. Sudeck's atrophy can complicate this condition. T
2. 3rd degree fracture should be treated by ORIF. T
3. 1st degree fracture can be treated by below knee plaster cast. T

Amputation Stump



- Below knee amputation showing cutting of tibia at a level lower than cutting of fibula.

Head & Neck

Depressed Skull Fracture

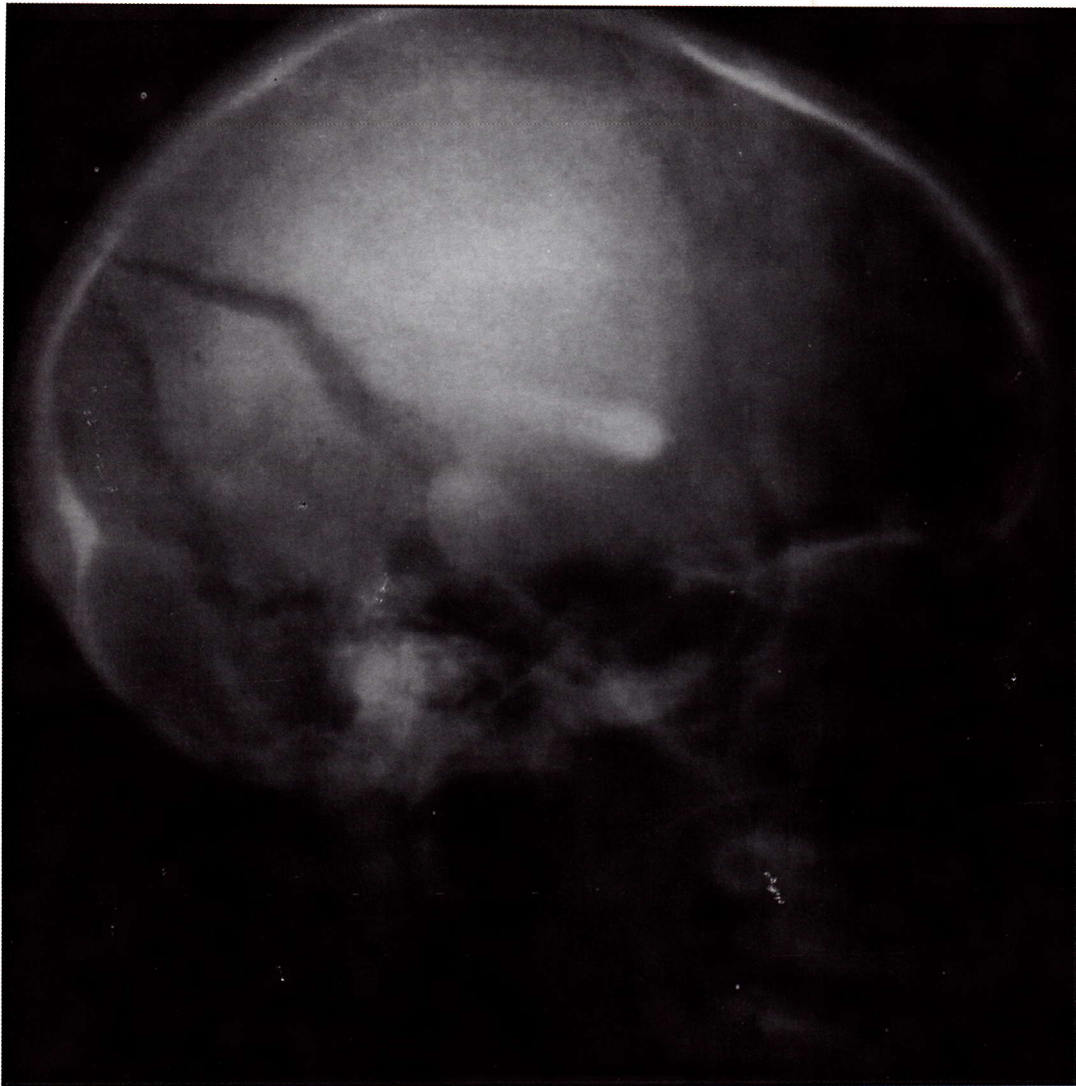


Questions

1. Operative repair is indicated if there is neurological deficit related to pressure area of the underlying brain.
2. Open skull fractures should be treated surgically.

T
T

Skull Fissure Fracture



Questions

1. This condition may be complicated by extra-dural hemorrhage.
2. All cases of skull fissure fracture should be treated surgically.

T
F

Fracture Spine

Comminuted Fracture of C7

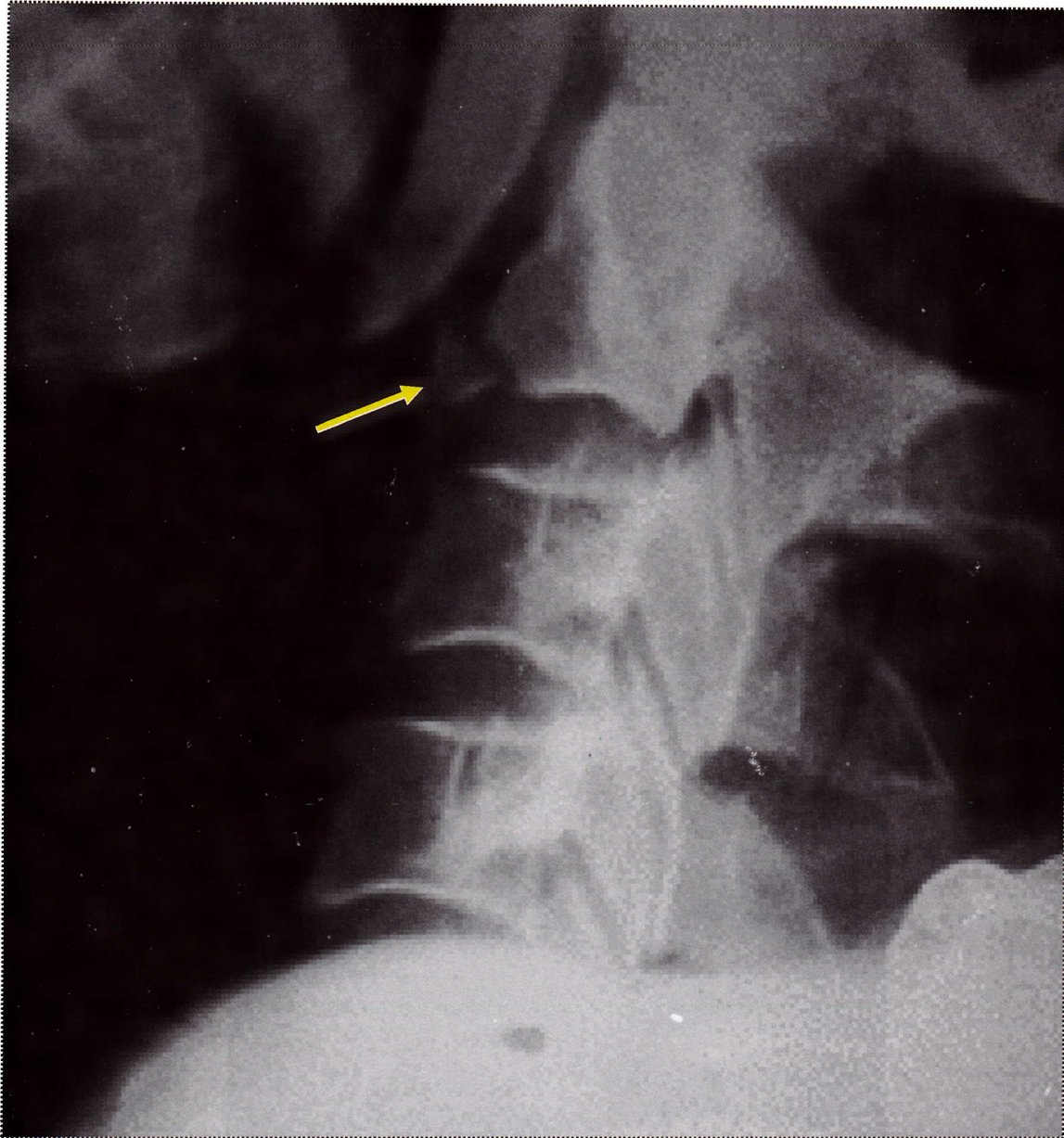


Questions

1. This fracture results usually from axial loading.
2. This fracture may result in spinal cord injury.

T
T

Hyperextension Fracture of C2

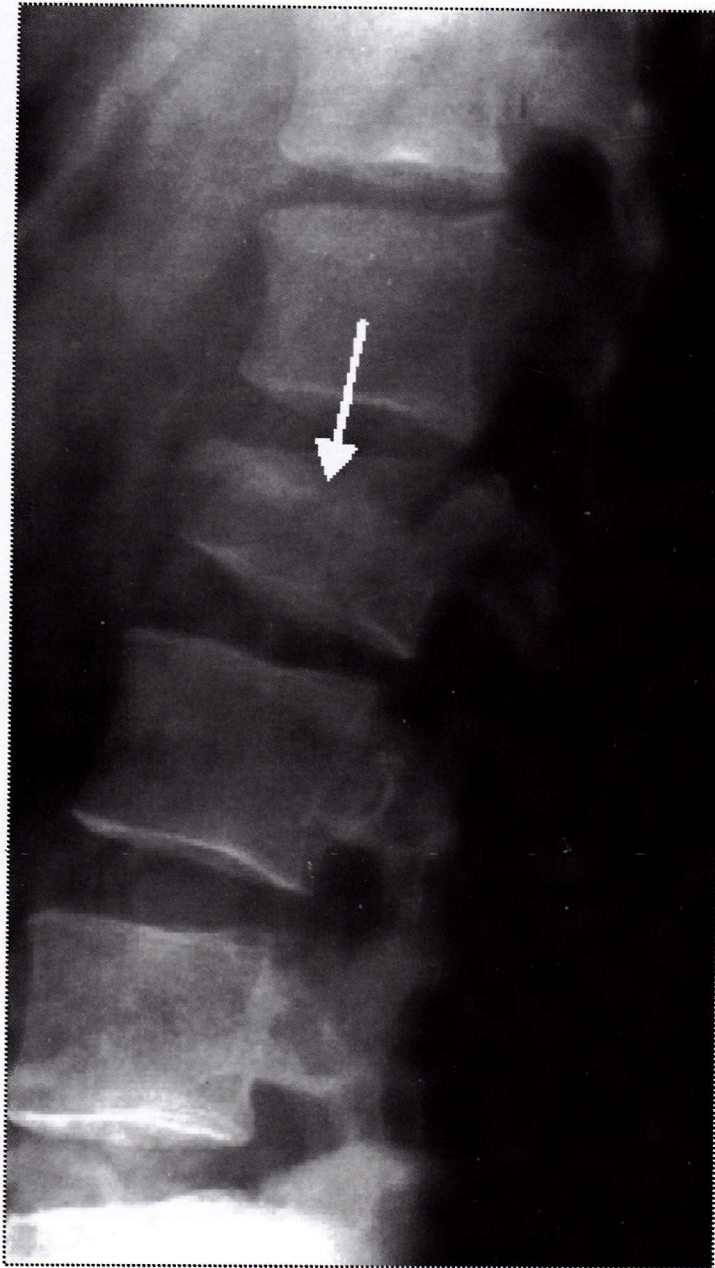


Questions

1. This fracture is common in elderly with osteoporosis.
2. This fracture is potentially unstable.

T
T

Compression (Wedge) Fracture of L2



Questions

1. This fracture is stable fracture.
2. Urgent surgical treatment is required.

T
F

Fracture dislocation of thoracic spine



Questions

1. This fracture is unstable resulting in injury of the spinal cord.
2. The cause of this fracture is flexion rotation injury.
3. Urgent surgical intervention is indicated.

T
T
T

Bone Inflammation

Chronic Osteomyelitis



■ Chronic osteomyelitis of tibia.

Questions

1. This disease is common in children.
2. This condition may be complicated with pathological fracture.
3. Surgical treatment is the best line of treatment.

T
T
T



■ **Chronic osteomyelitis of big toe.**

Questions

- This condition is common with diabetic foot infection. **T**

Pott's Disease



■ X-ray

■ Showing osteolytic lesion causing destruction of both vertebrae & inter-vertebral discs.

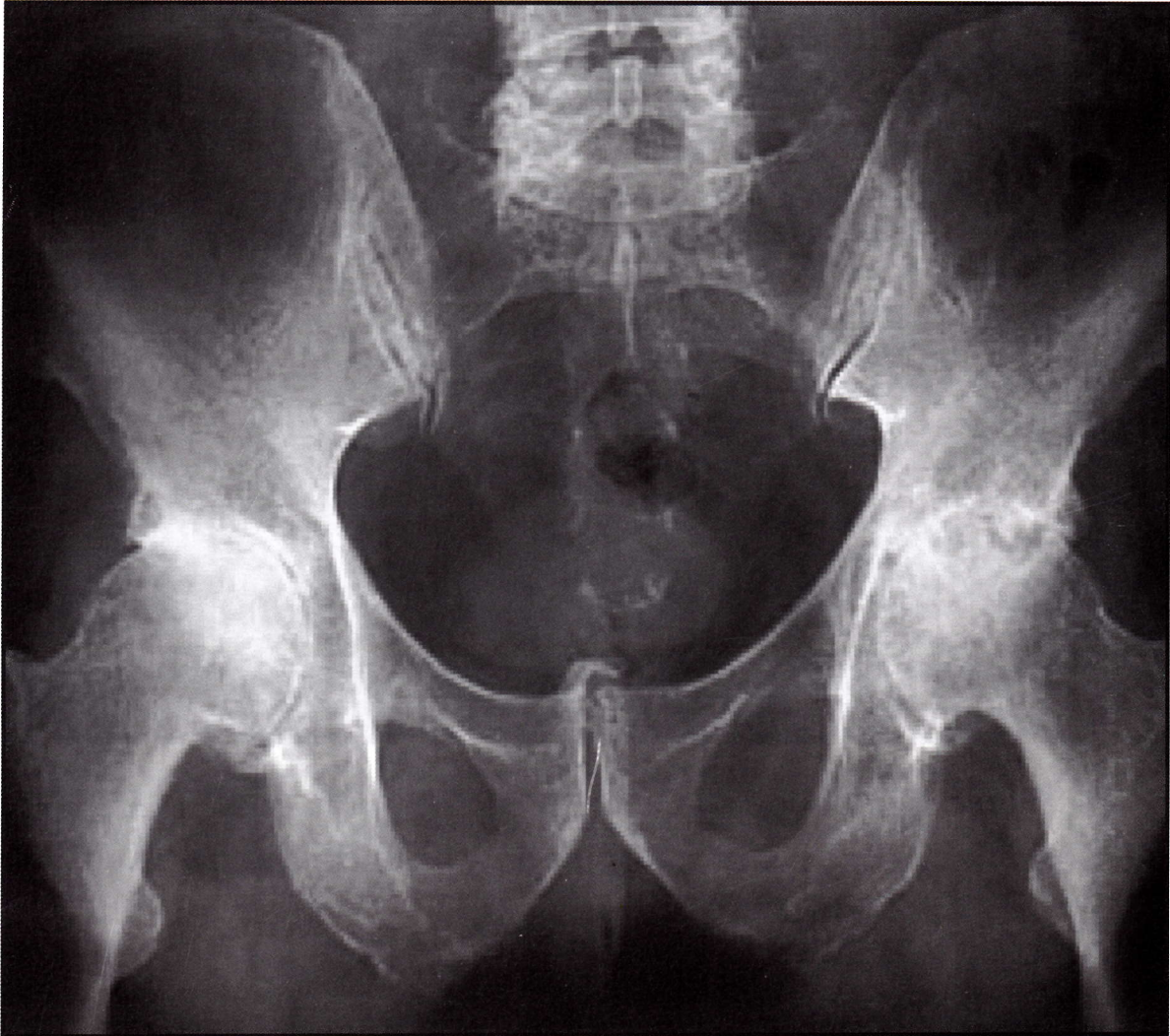
Questions

1. This condition is caused by malignancy.
2. Paraplegia can occur with this condition either early or late.
3. Initial treatment depends on anti-tuberculus drugs.

F
T
T

Bone diseases

Osteoarthritis of Hip Joints



■ Seen as obliteration of joint space.

Myositis Ossificans

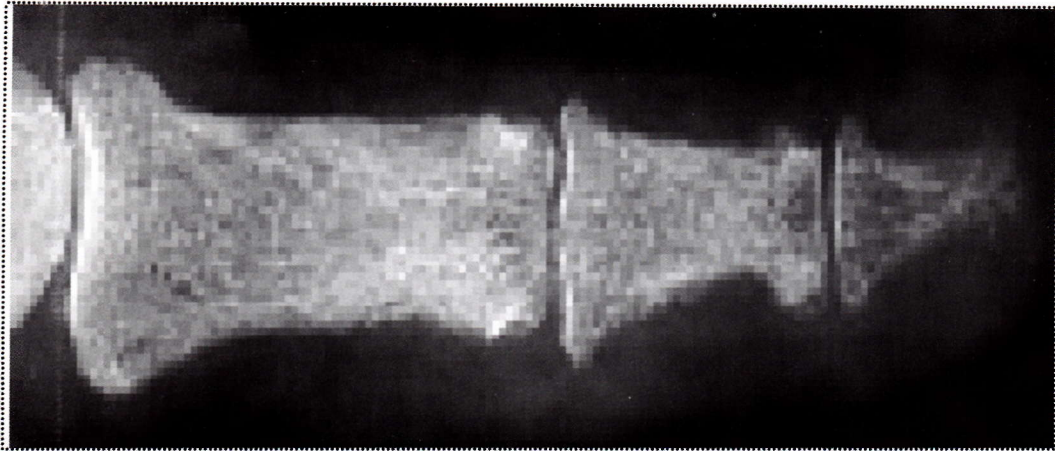


■ Seen as a shadow of calcification outside the bone.

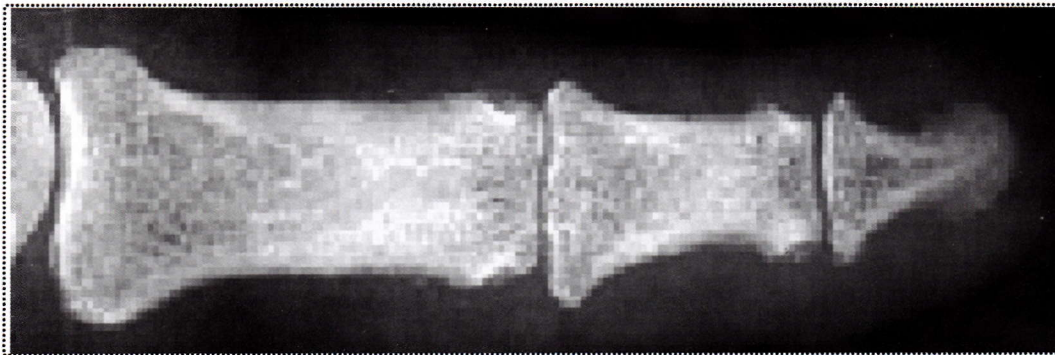
Malunion



Hyperparathyroidism



Hyperparathyroidism



Normal



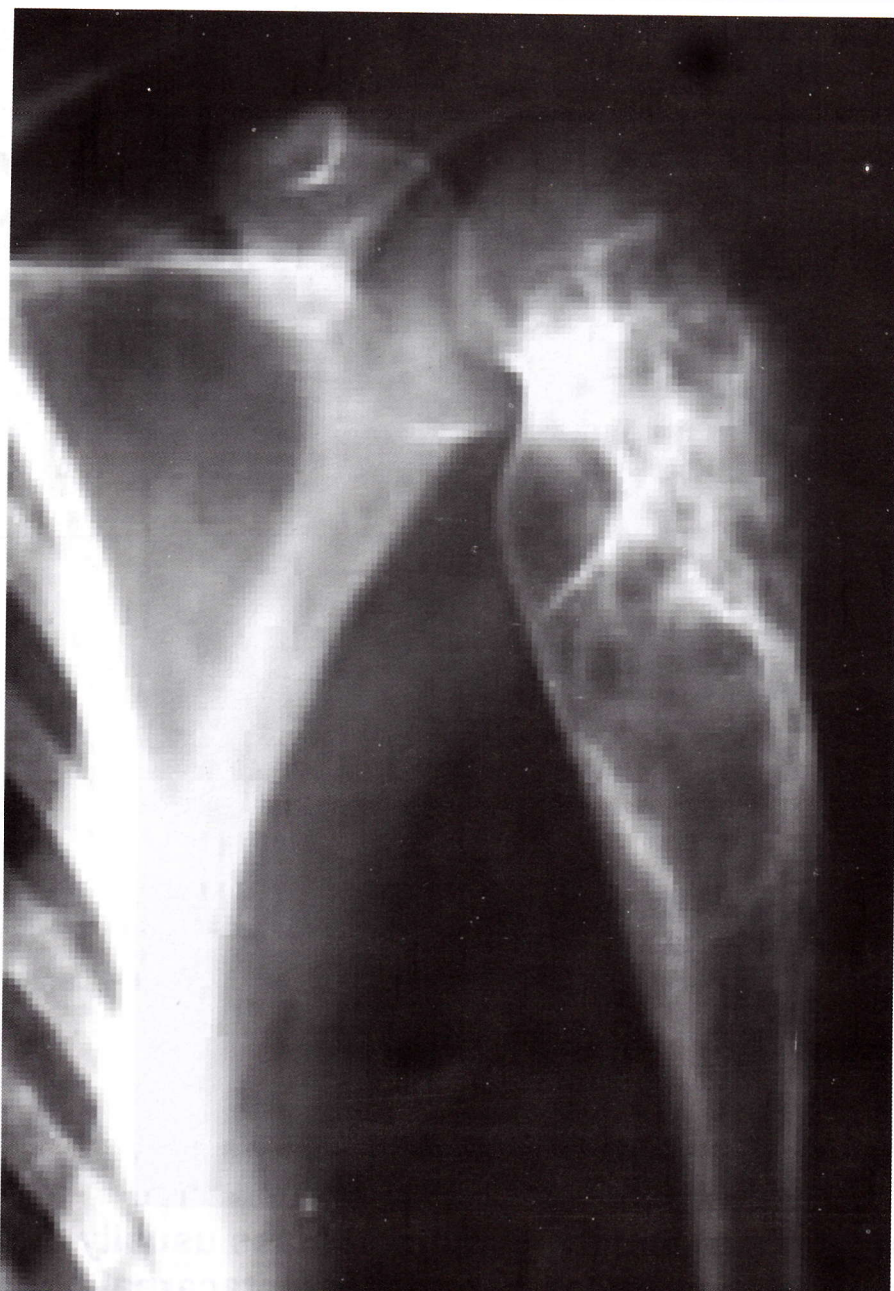
■ Seen as acro-osteolysis together with multiple bone cysts.

Simple Bone Cyst



■ Seen as a unilocular cyst without septa.

Aneurysmal bone cyst



■ Seen as multilocular cyst.

Bone Tumors

Chondroma



■ Seen as radiolucent well defined mass usually arising from short long bones commonly metacarpal bones.

Questions

1. Enchondroma expand bone from inside.
2. Chondroma may be complicated with pathological fracture.
3. Curettage & bone graft is the treatment of choice.

T
T
T

Exostosis (Osteochondroma)



- Seen as cartilage covered bony projection arising from metaphysis of a long bone.

Questions

1. Clinical examination reveals a mass bigger than seen in x-ray.
2. This lesion can lead to limitation of movement of adjacent joint.

T
T

Osteosarcoma



■ Seen as soft tissue mass arising from metaphysis of long bone with bone destruction & new bone formation in the form of sunray layering & Codman's triangle.

Questions

1. This tumor usually occurs in young age. T
2. It is a locally malignant tumor. F
3. Codman's triangle is composed of lifted periosteum due to new bone formation. T
4. Surgical treatment is the best line of treatment. T

Giant Cell Tumor



- Seen as well localized soft tissue mass arising from epiphysis of long bone causing bone destruction with no new bone formation.

Questions

1. This is a locally malignant tumor.
2. Recurrence is a common complication after treatment.
3. Differential diagnosis of this condition includes acute osteomyelitis.

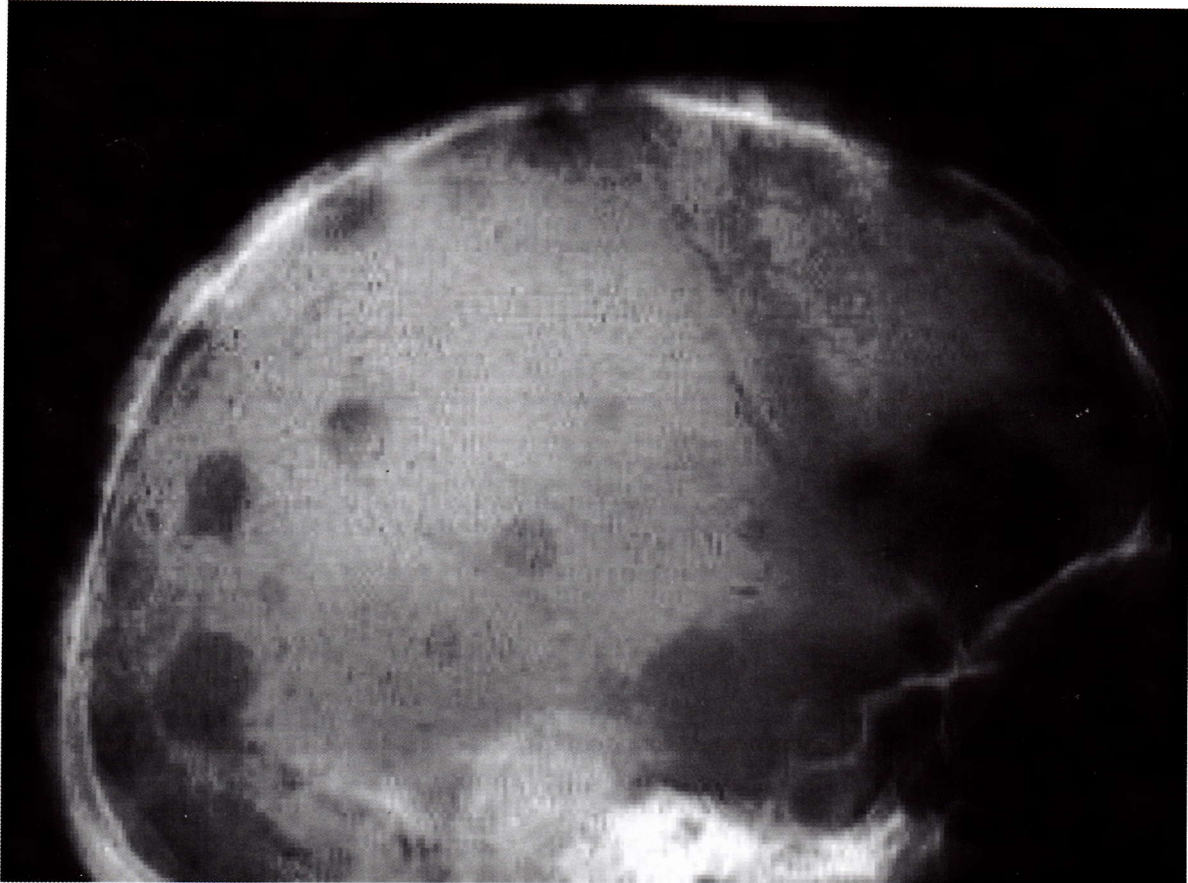
T
T
F

Chondrosarcoma



- Seen as a tumor with areas of calcification usually affecting flat bones.

Multiple Osteolytic Skull Lesions

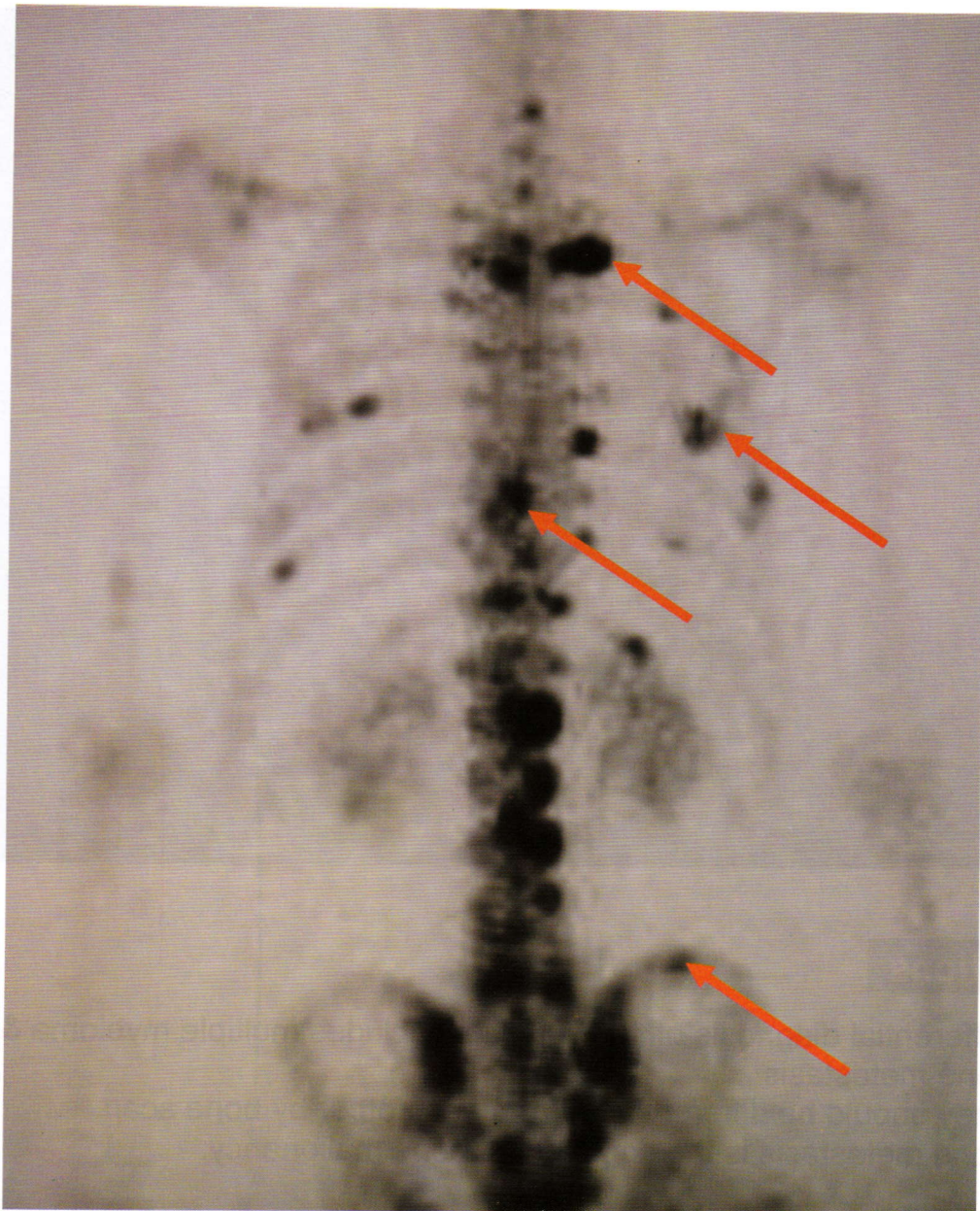


Questions

1. Differential diagnosis of this condition includes multiple myeloma & bone metastasis.
2. They should be differentiated from each other by bone scan.
3. Bone metastasis is the commonest bone malignancy.

T
T
T

Bone Metastases In Bone Scan

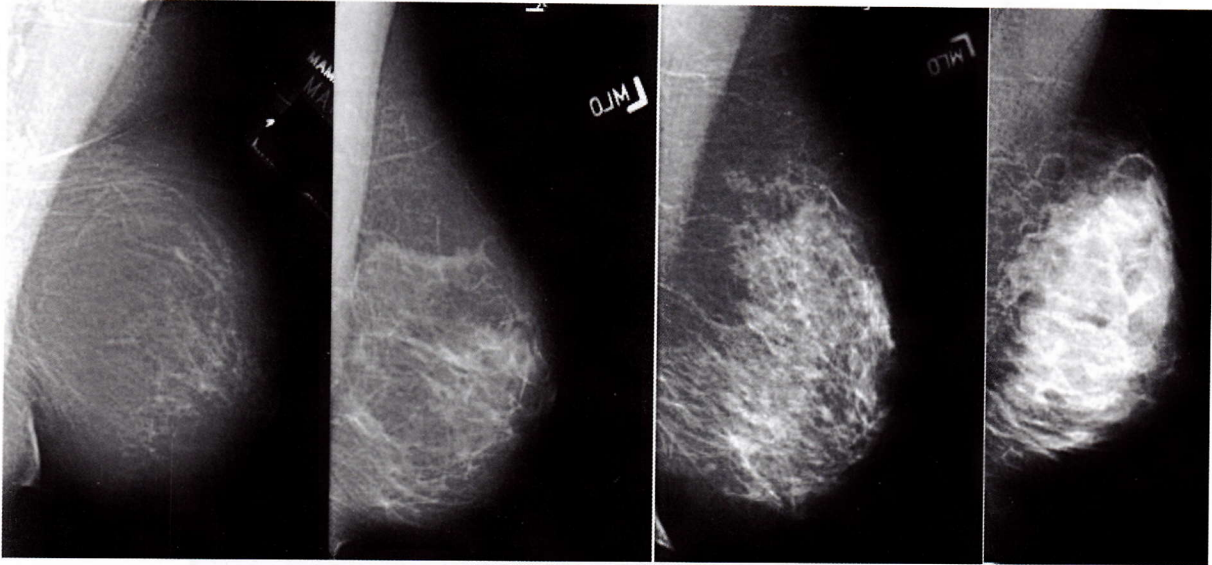


■ Seen as multiple hot (dark) spots.

-9-

Breast Radiology

Normal Appearance

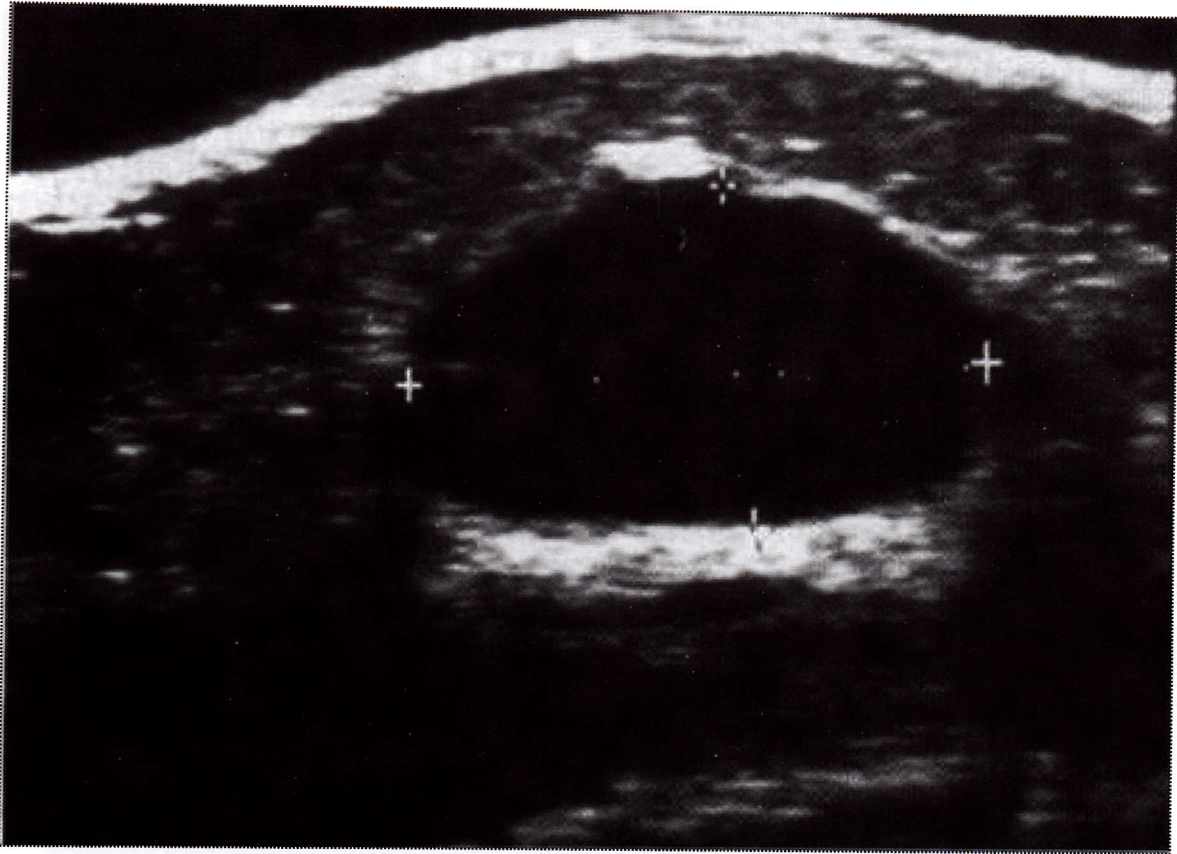


- Normal appearance of breast varies with age.
- With progress of age, female breast loses some of its glandular tissue & becomes less dense on mammogram.

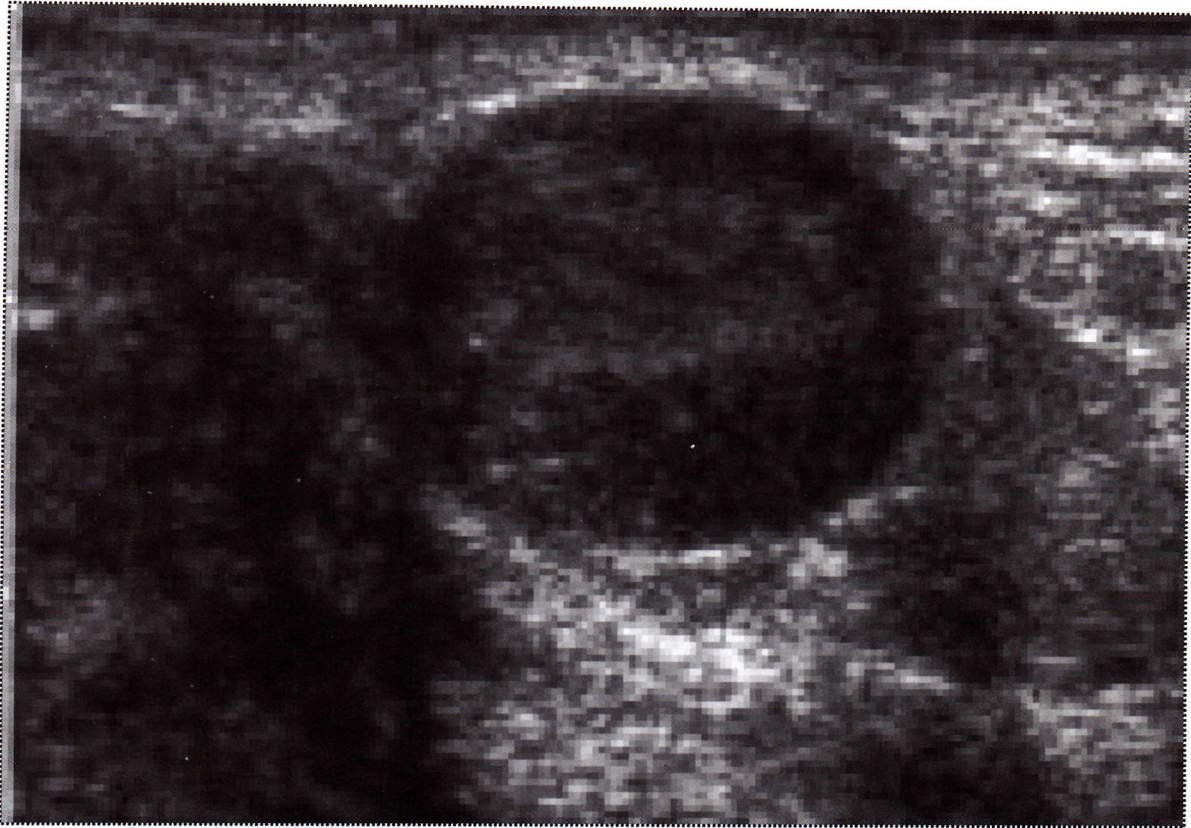
Benign Lesions



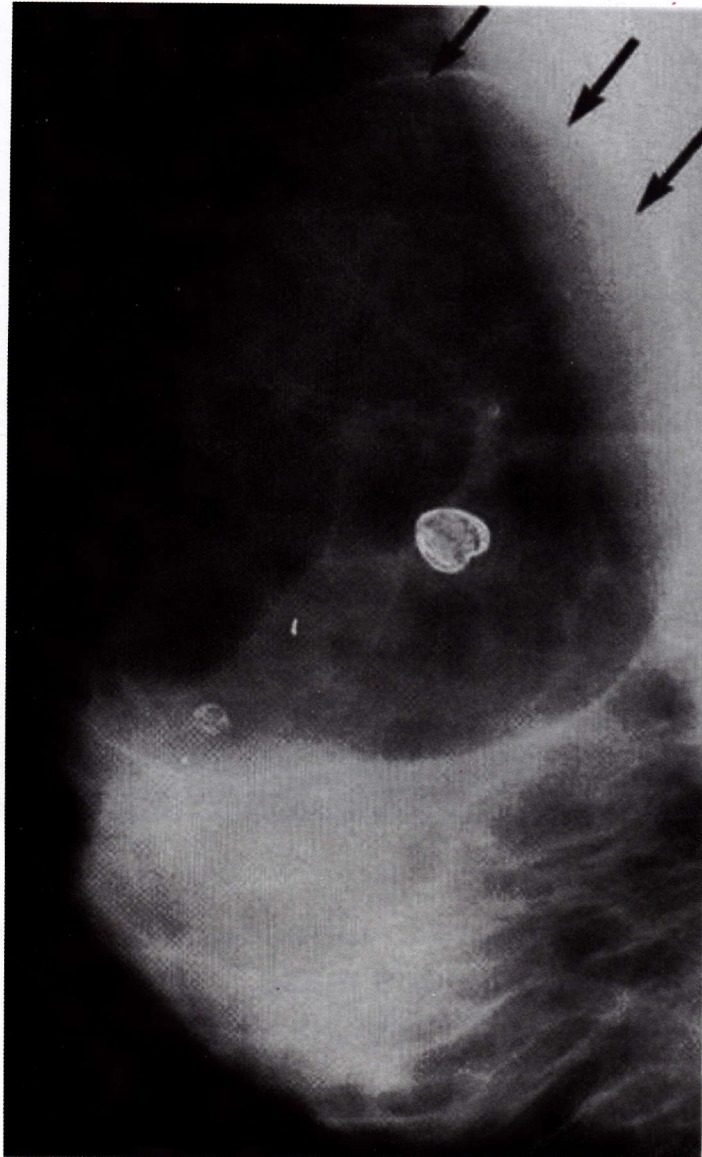
- Either cyst or fibroadenoma appear in mammography
- As well defined radio-opaque mass without microcalcifications.



- Cyst appears in ultrasound as well defined anechoic (black) mass with posterior echoic accentuation (white):



- Fibroadenoma appears in ultrasound as well defined hypo-echoic homogenous mass.



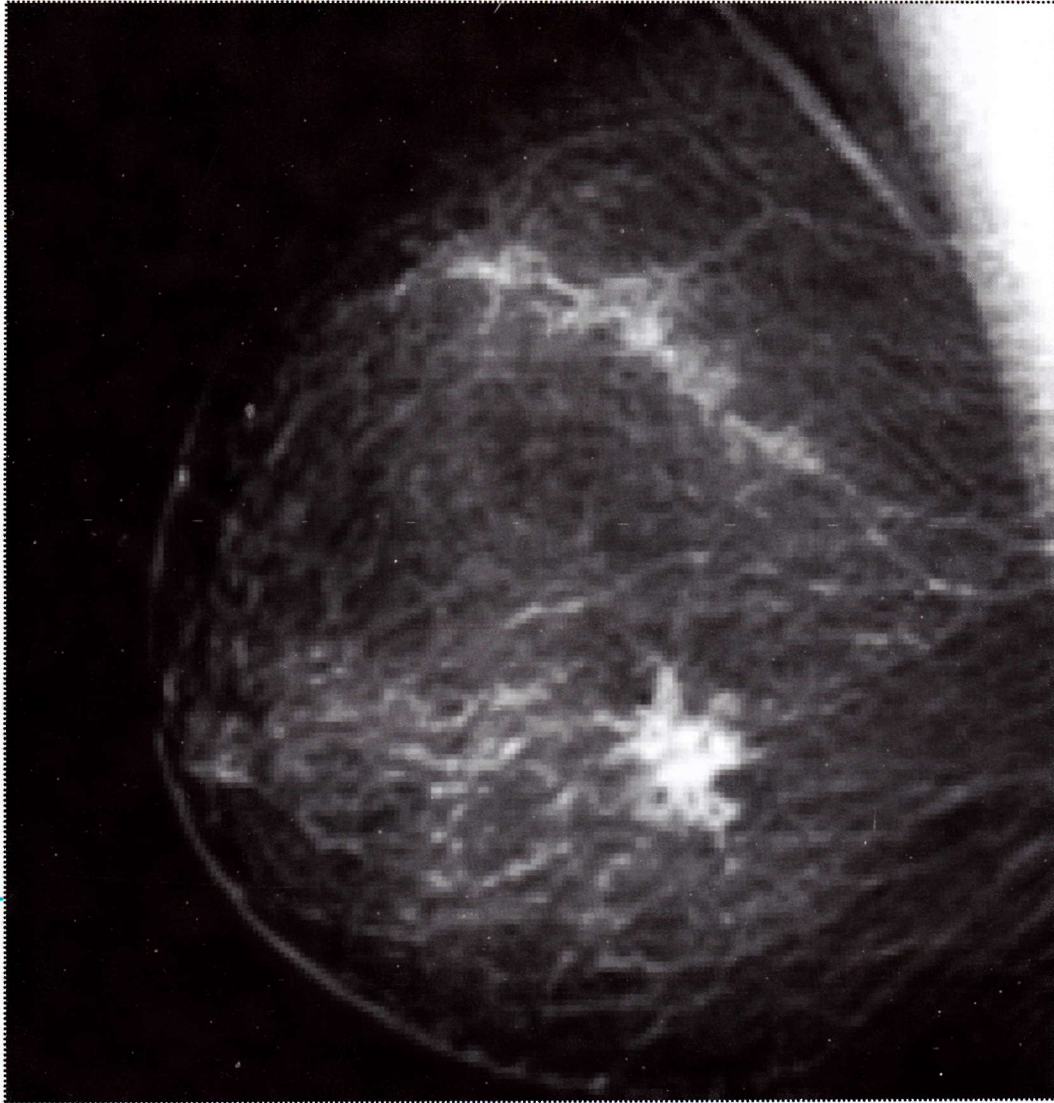
■ Lipoma appears in mammography as well defined radiolucent mass with thin capsule with or without coarse calcifications.

Questions

1. Mammography is better than US in diagnosis of breast lesions in young females. F
2. Mammography is used in screening programs for breast lesions. T
3. Mammography & US are enough for diagnosis of breast lesions without biopsy. F

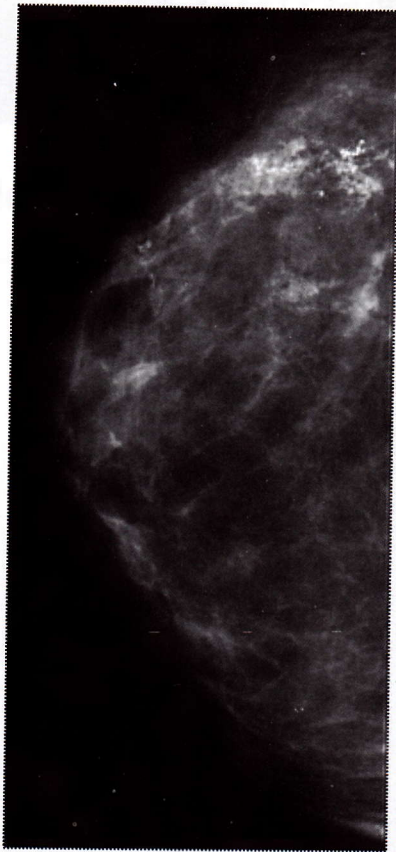
Malignant Lesions (Breast Cancer)

→ Findings suggestive of malignancy in mammography:



■ Irregular mass with speculated outline.

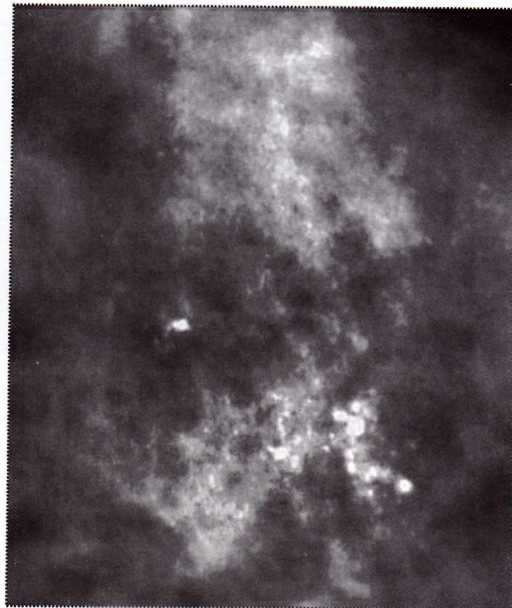
■ Microcalcifications



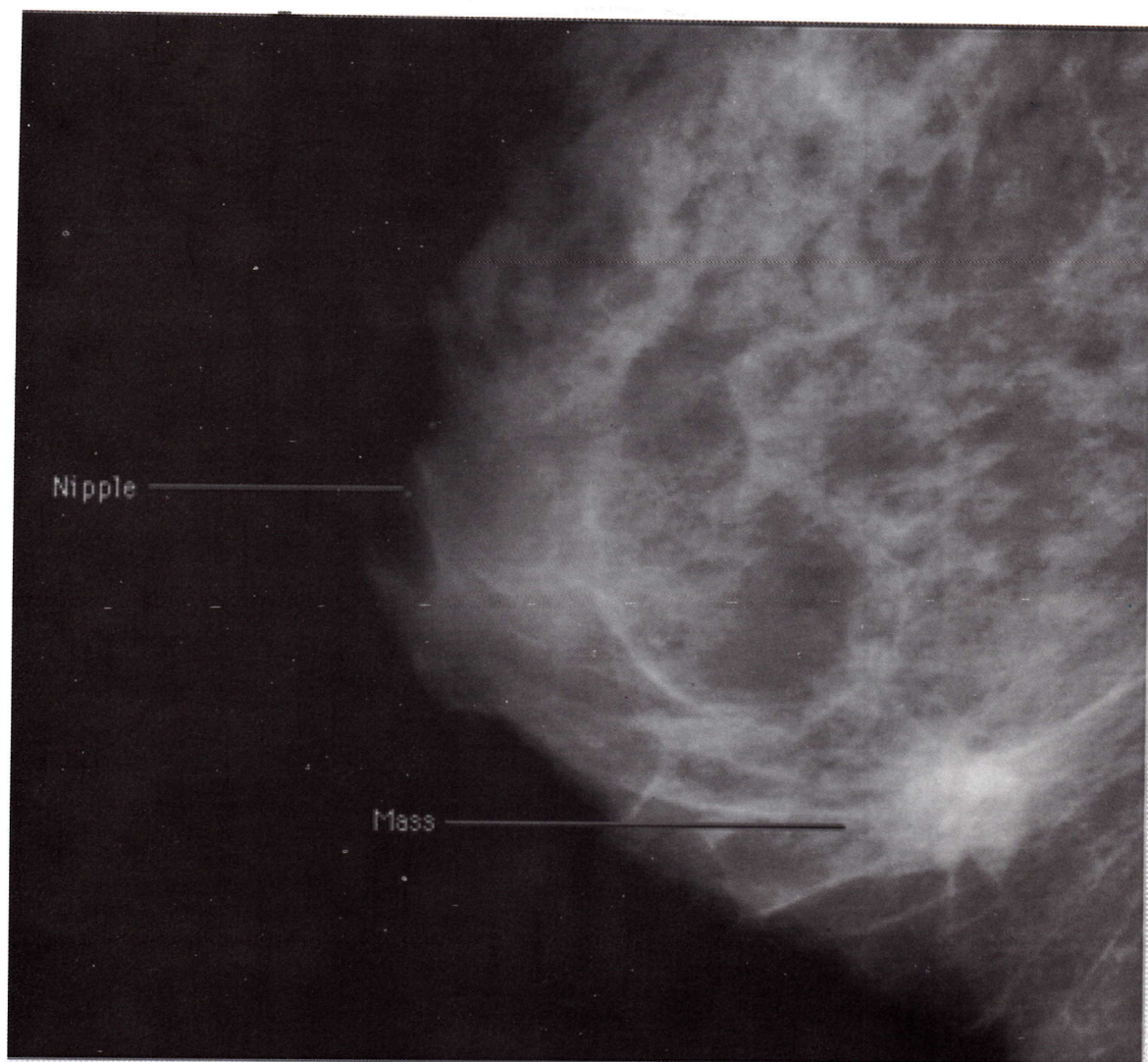
Cranio-codal view



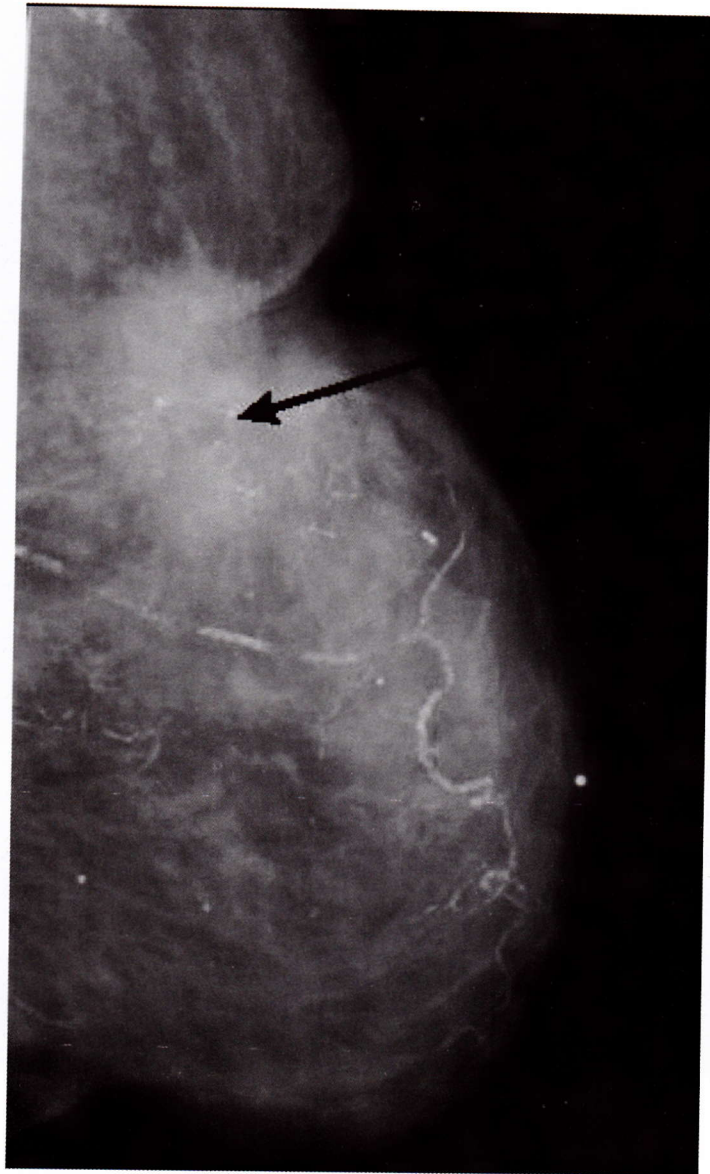
Medio-lateral view



Close-up view



■ Mass with nipple retraction.



■ **Mass with skin retraction.**

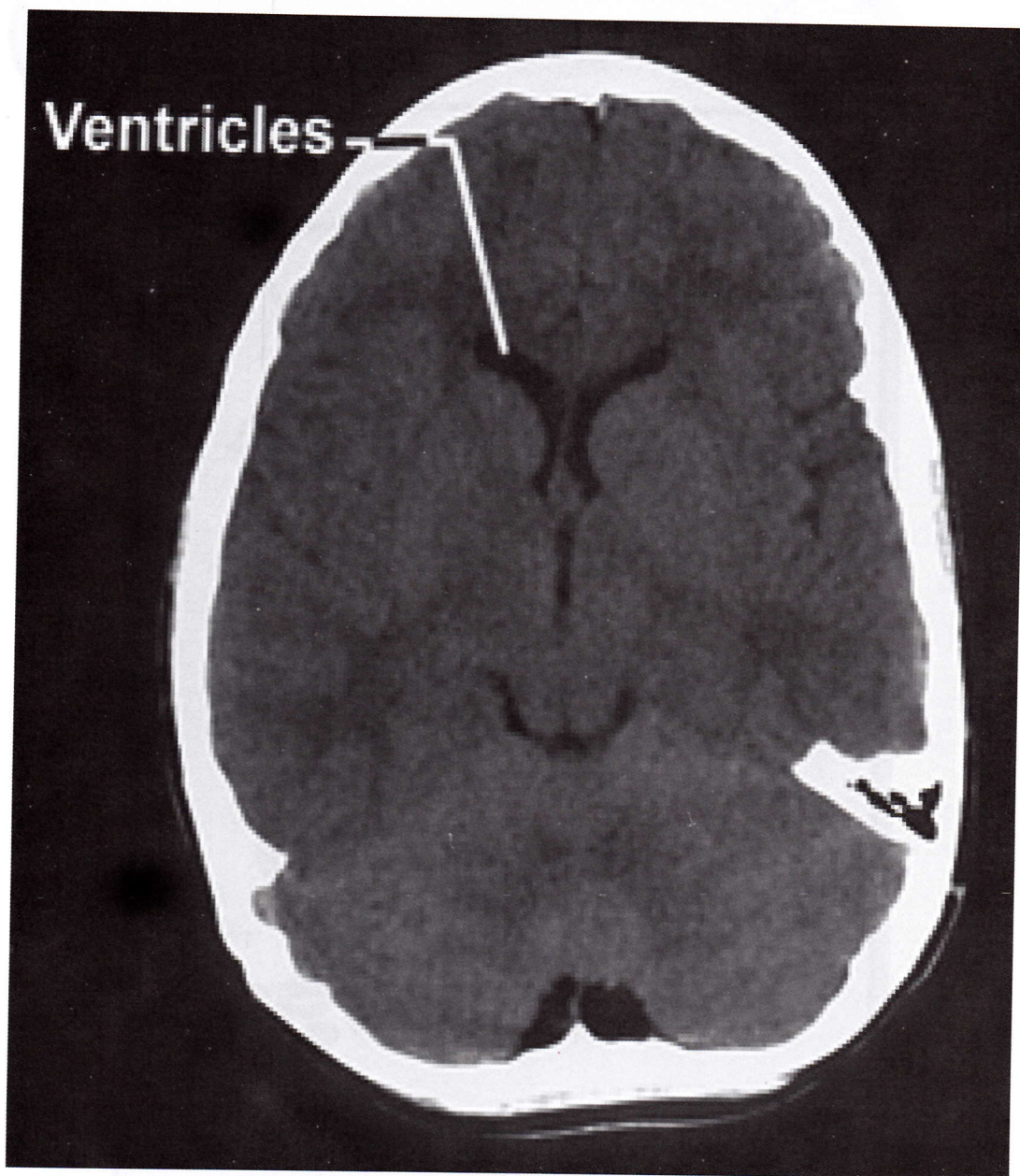
Questions

1. Most common clinical presentation for this condition is painless breast lump. T
2. The next step after mammography & US should be fine needle aspiration biopsy. T
3. Skin ulceration, bleeding per nipple & distant metastasis are possible complications. T
4. Radical surgery is the treatment of choice in early cases. T

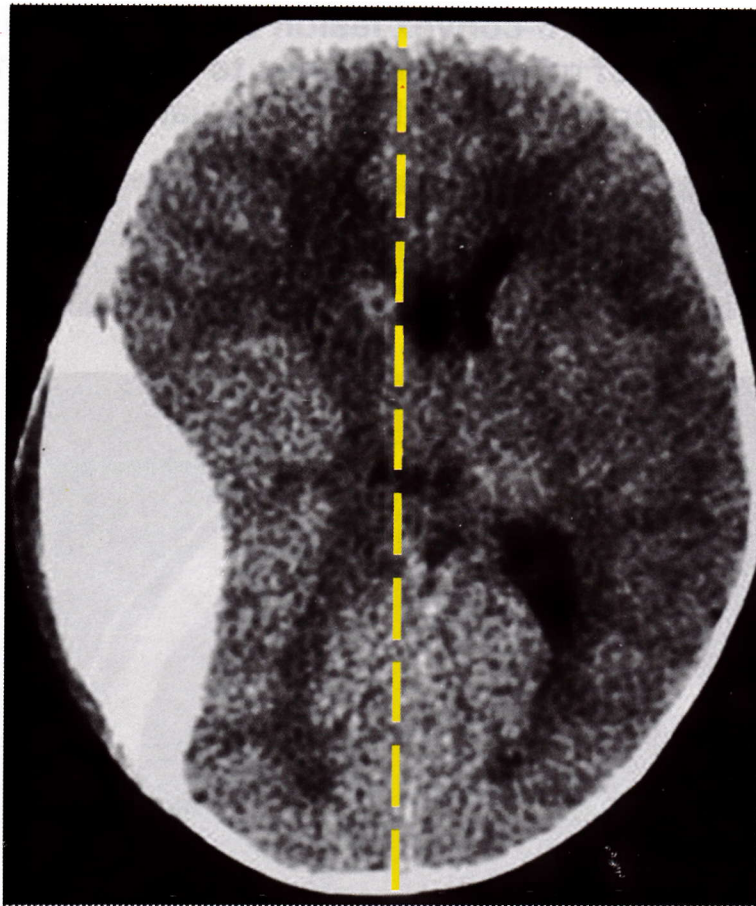
-10-

**Neuro-
Surgery
Radiology**

Normal CT Brain



Extra-dural Hemorrhage



➡ **Note:**

- Hyperdense biconvex lesion on the inner side of the skull.
- Shift of midline structures to the opposite side with or without compression of ventricular system.

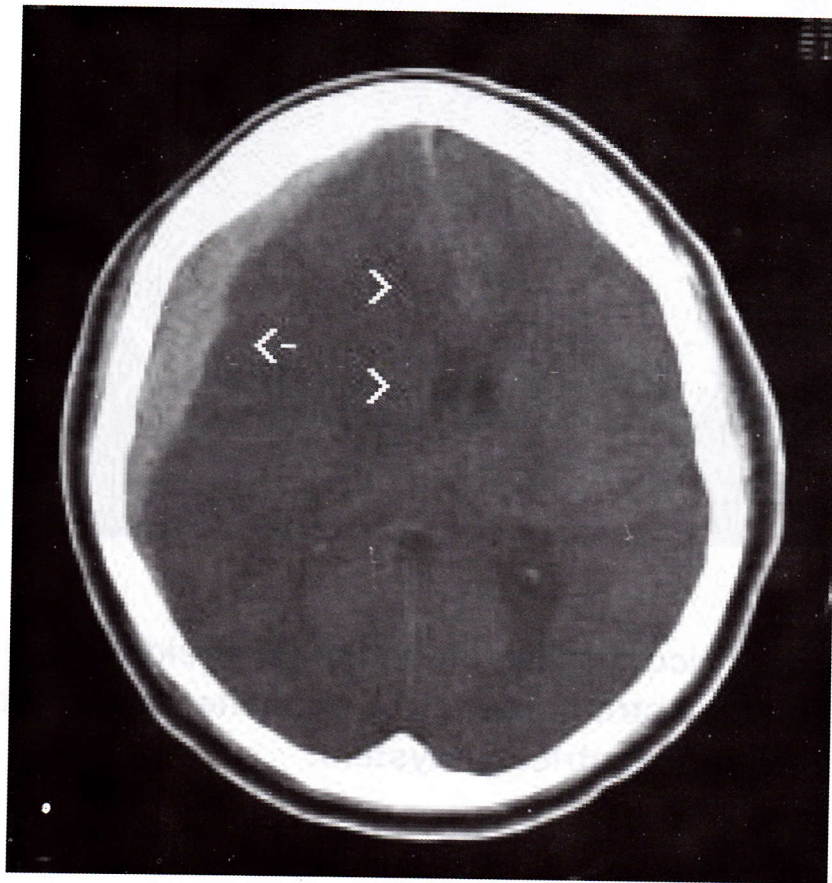
Questions

1. This condition is traumatic. T
2. The most common cause of this condition is middle meningeal artery injury. T
3. Patients usually pass from concussion stage to compression stage without lucid interval. F
4. Urgent surgical treatment is required for this condition. T

Sub-dural Hemorrhage

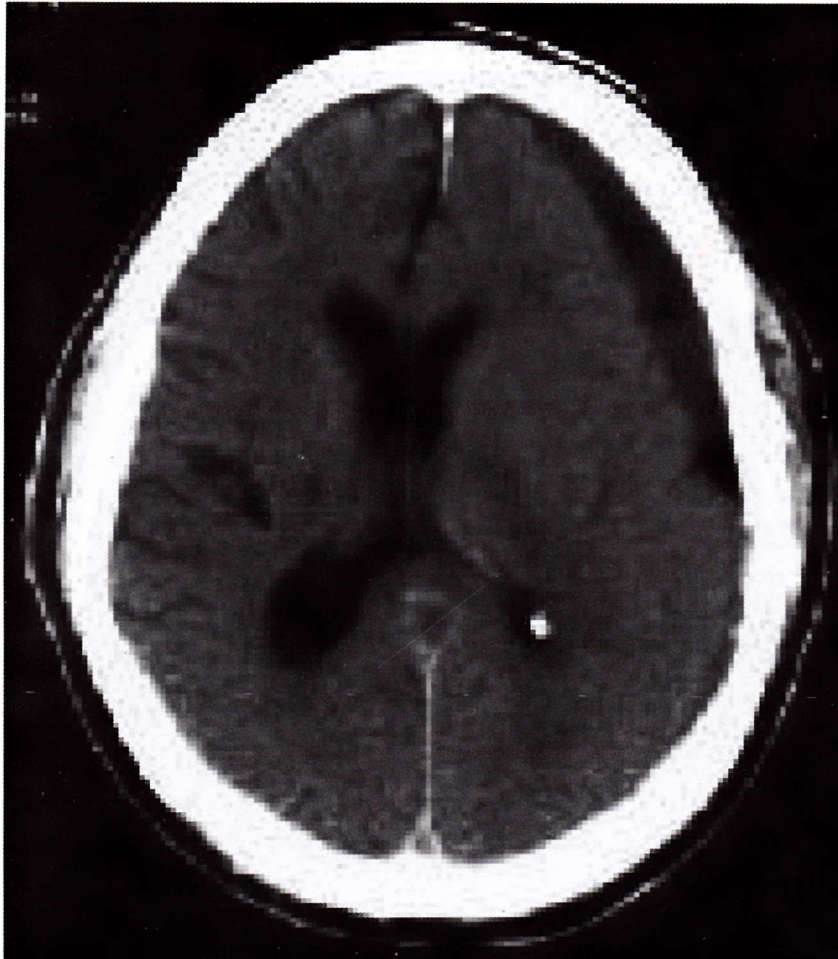
- Appears as concavo-convex lesion on the inner side of the skull with shift of midline structures to the opposite side with or without compression of the ventricular system.

A-Acute Sub-dural Hemorrhage



- Appears as hyperdense lesion.

B- Chronic Sub-dural Hemorrhage



- Loses its density gradually & may appear as hypodense lesion.

Questions

1. This condition occurs spontaneously.
2. This condition occurs mostly due to injury of bridging cerebral veins.
3. Medical treatment is the main line of treatment.

F
T
F

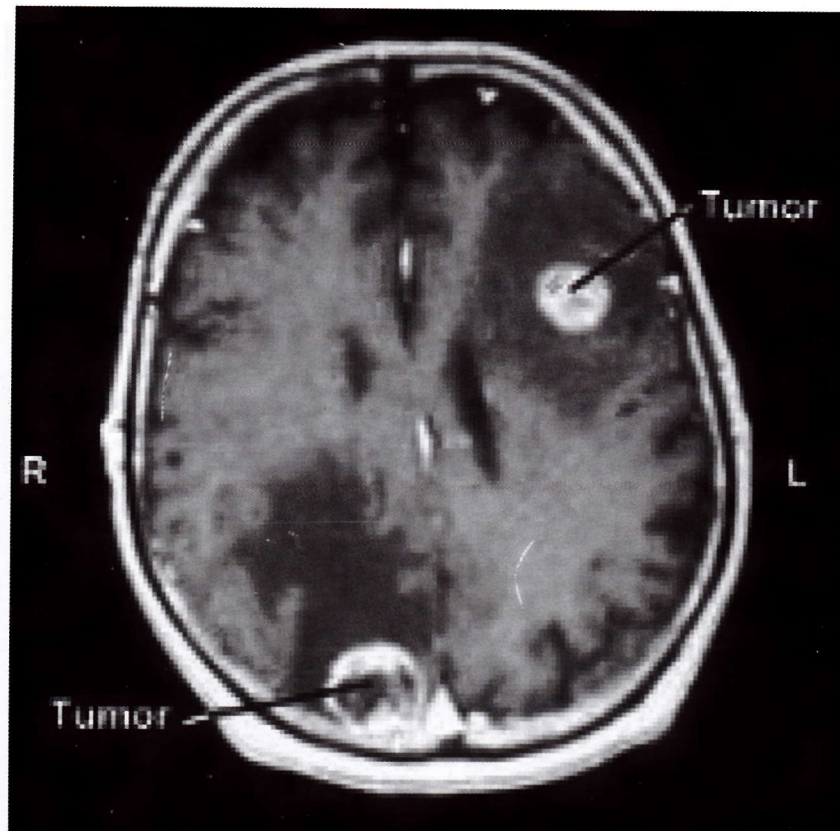
Brain Tumors

Meningioma



- Is seen as a mass in the brain causing shift of midline structures with marked enhancement after IV contrast material administration.

Brain Metastasis

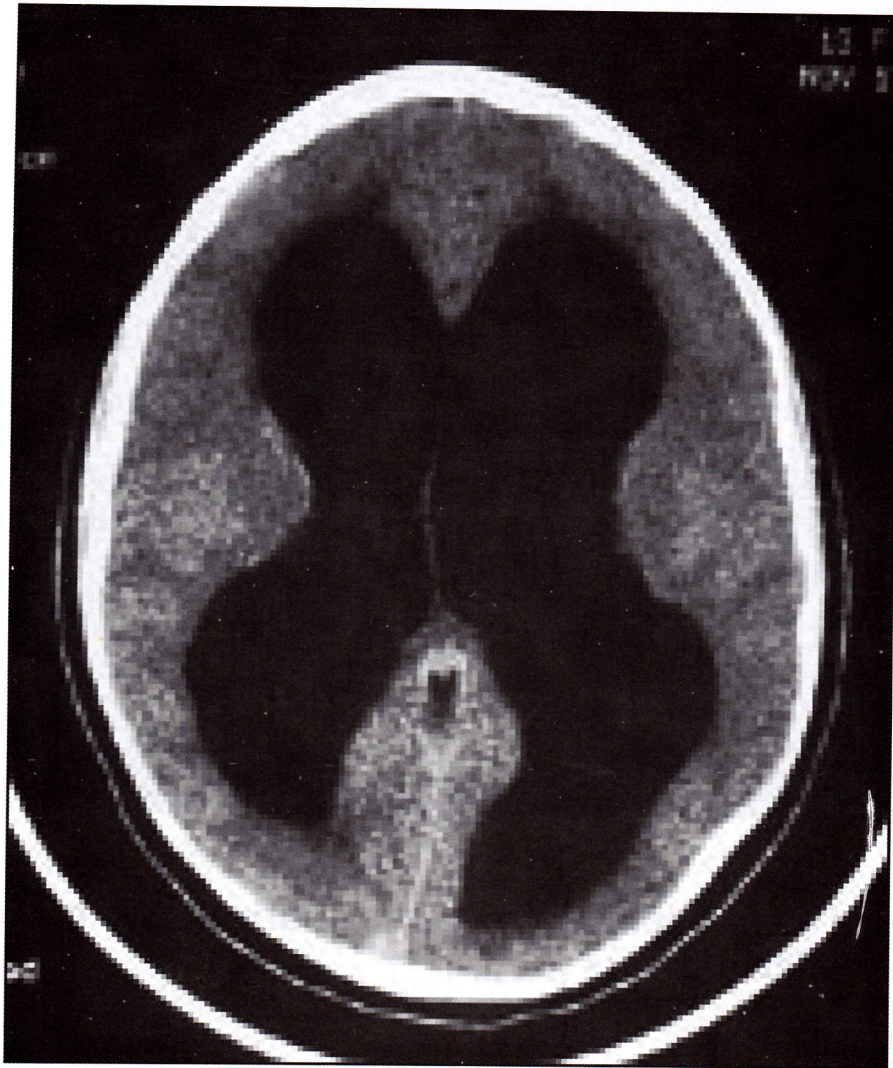


■ Is seen as multiple brain masses surrounded by edema zone which appears grey.

Questions

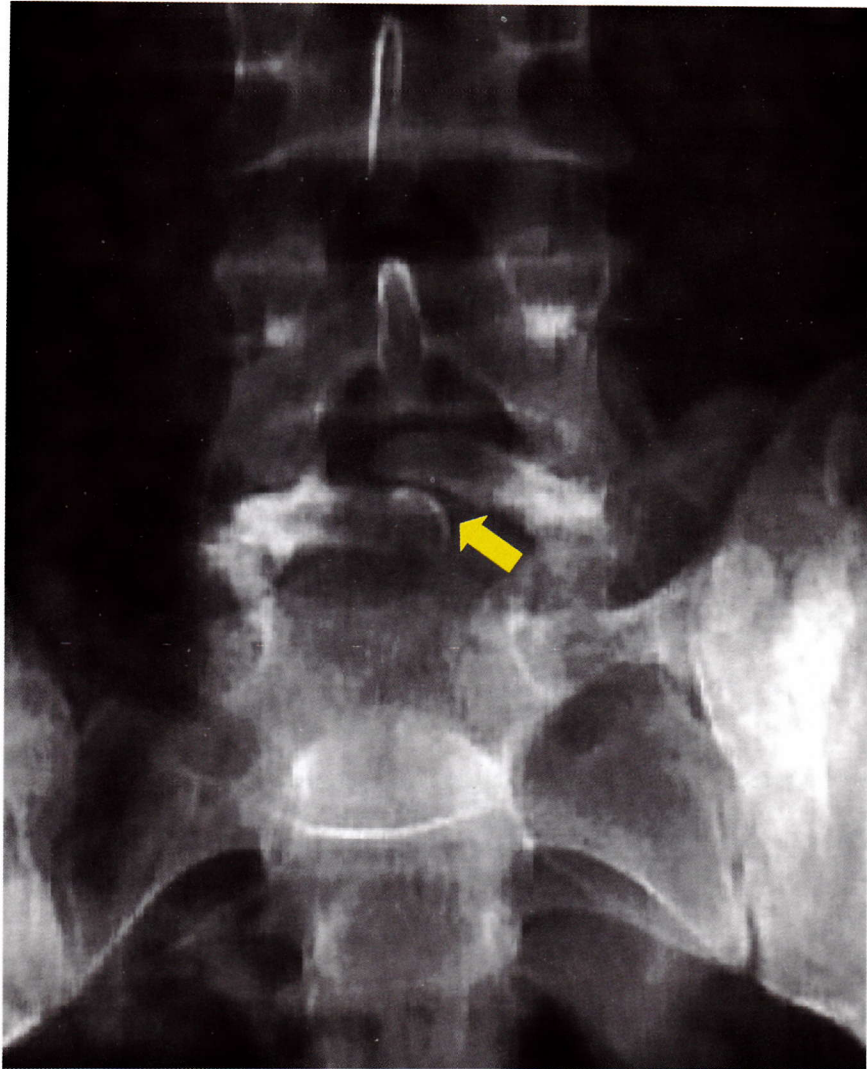
1. Brain metastases are the most common brain malignancies. T
2. Brain tumors show central enhancement while brain abscess shows ring enhancement in CT with contrast. T
3. Patients of brain tumors present with manifestations of increased intracranial tension. T
4. Biopsy can confirm the diagnosis of brain abscess. T
5. Surgical treatment is the main line of treatment of meningioma. T

Hydrocephalus



■ Showing dilatation of ventricular system of the brain.

Spina Bifida



■ **Seen as absent spinous process of the vertebra (L5 in the photo).**

Questions

1. The cause of this condition is congenital absence of posterior neural arch of the vertebrae. T
2. Most common site of this condition is lumbo-sacral vertebrae. T
3. Subtypes of this condition are occulta & manifesta. T

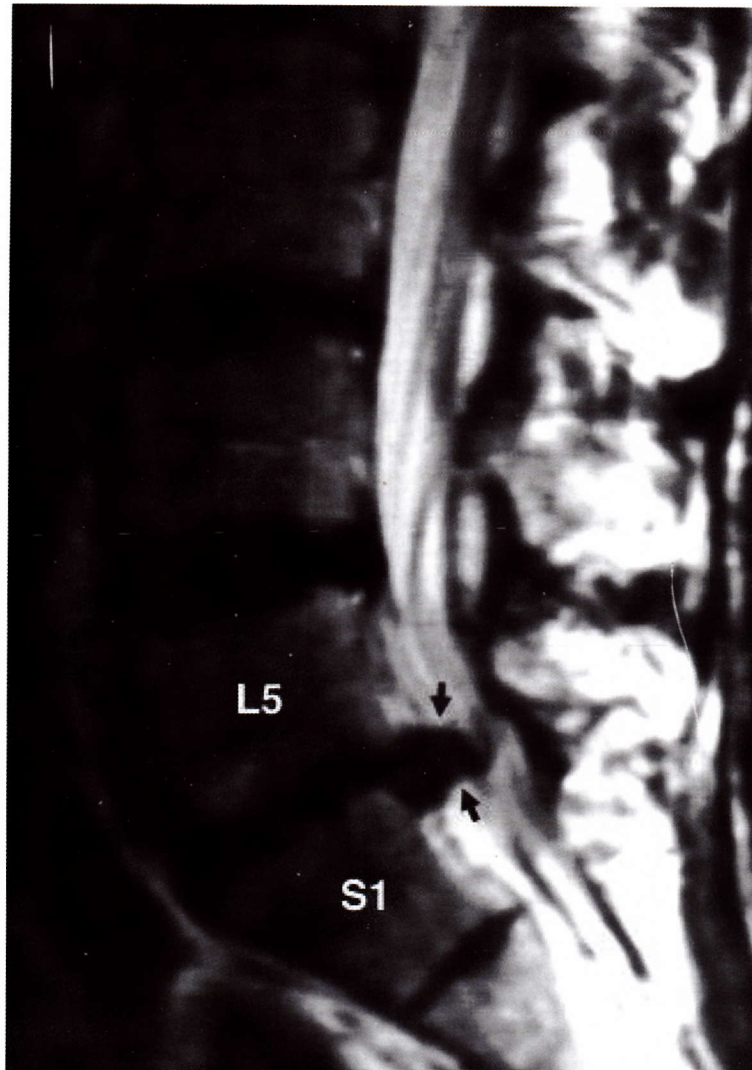
Disc Prolapse

Myodilmyelography



- Shows multiple levels of narrowing of myodil column in the sub-arachnoid space indicating multiple level disc prolapse.

MRI



■ Shows prolapse of inter-vertebral disc between L5 & S1.

Questions

1. Myodil myelography is an old invasive technique.
2. MRI is essential investigation to evaluate this condition.
3. Surgery is reserved for complicated cases only.

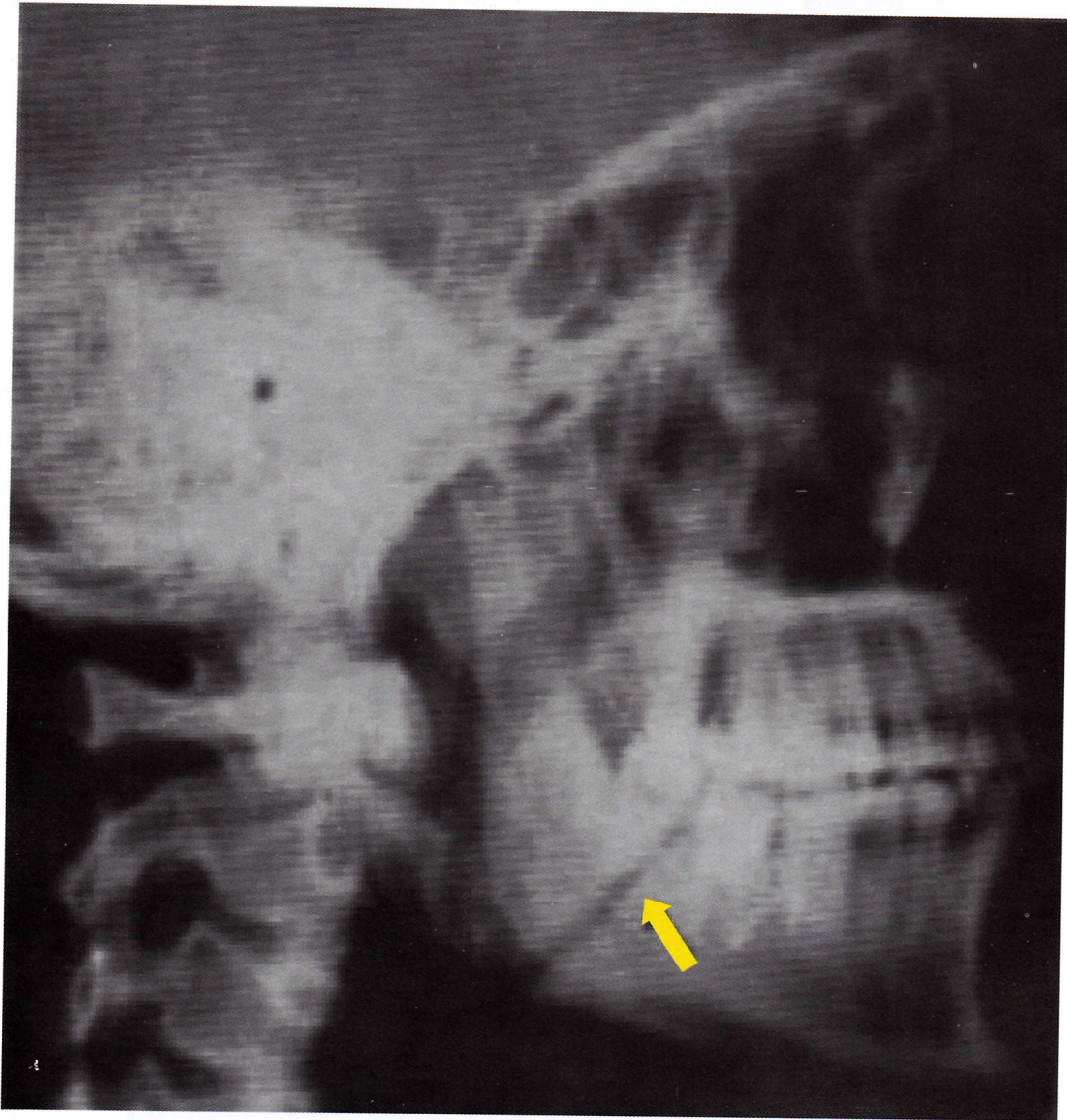
T
T
T

-11-

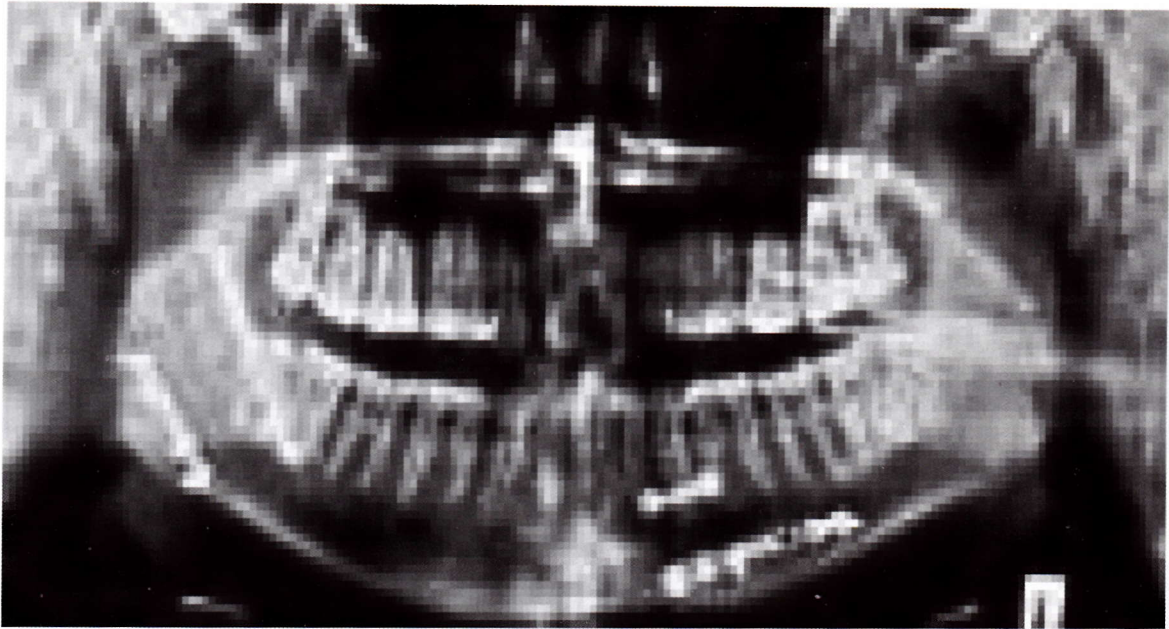
**Miscellaneous
Radiology**

Jaw

Fracture Mandible



■ Plain x-ray showing fracture mandible.

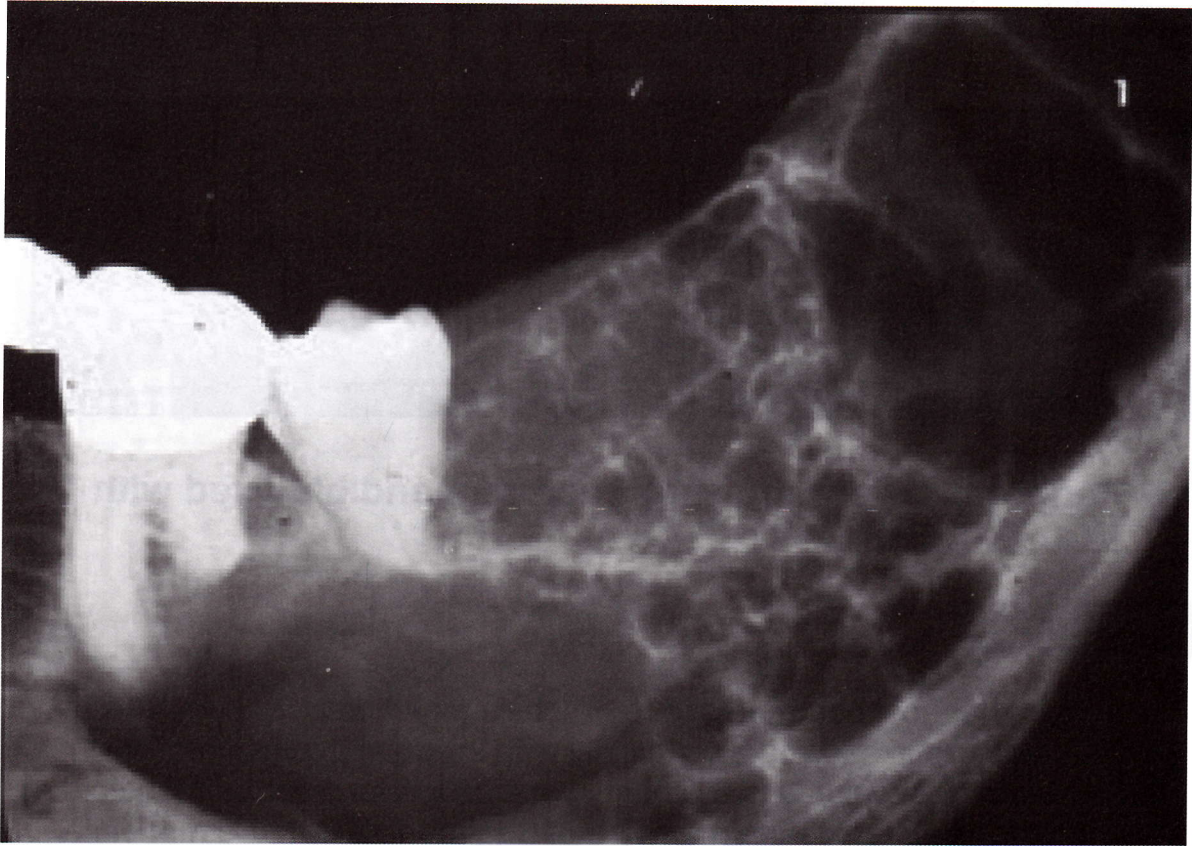


■ **Panoramic view showing fracture mandible fixed with plates & screws.**

Questions

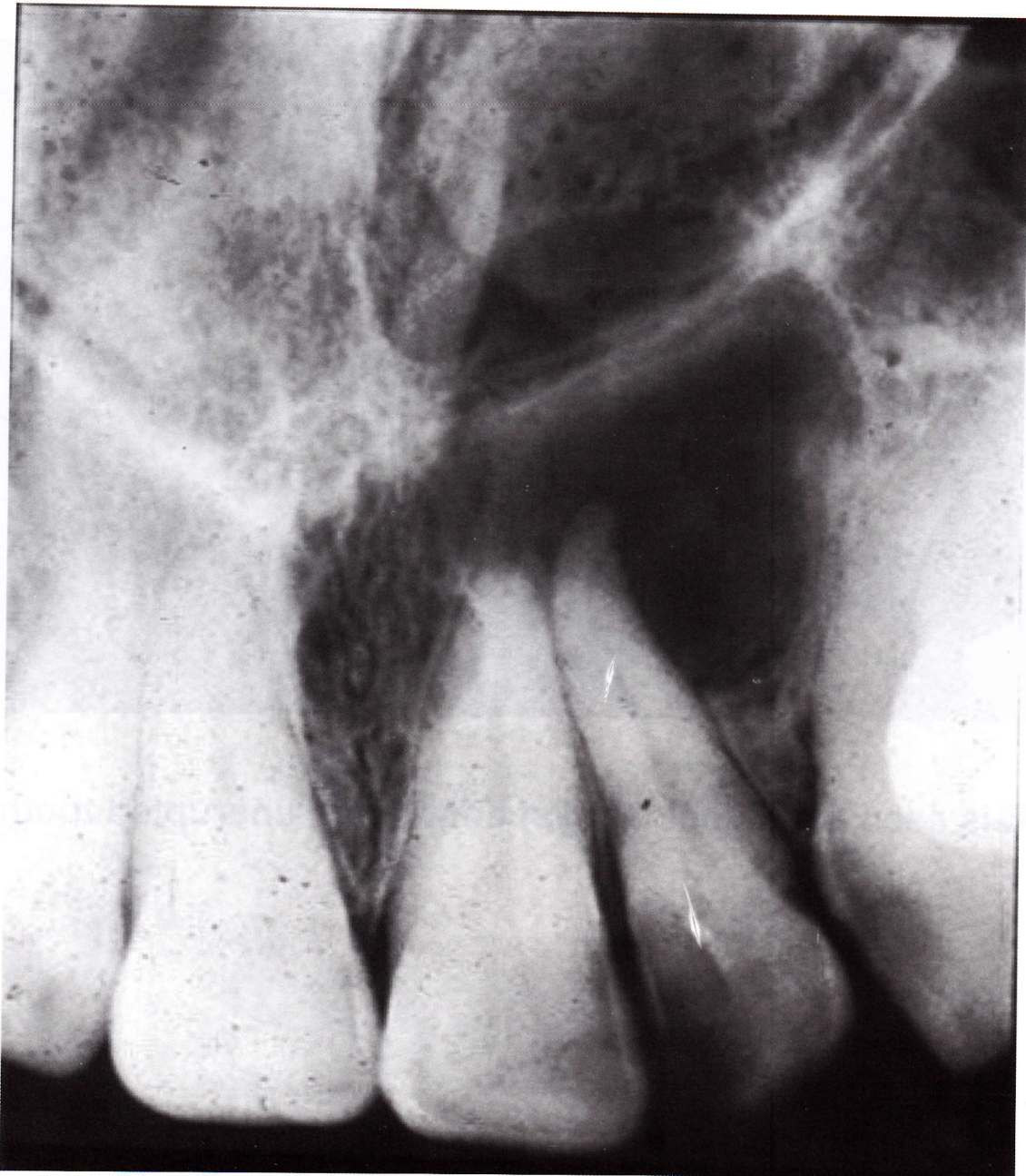
1. This is the most common site for fracture mandible. **T**
2. This fracture is associated clinically with irregular occlusion of teeth. **T**
3. Panoramic view study is the best investigation for fracture mandible. **T**
4. Surgical treatment is the main line of treatment of fracture mandible. **T**

Ameloblastoma (Adamantinoma)



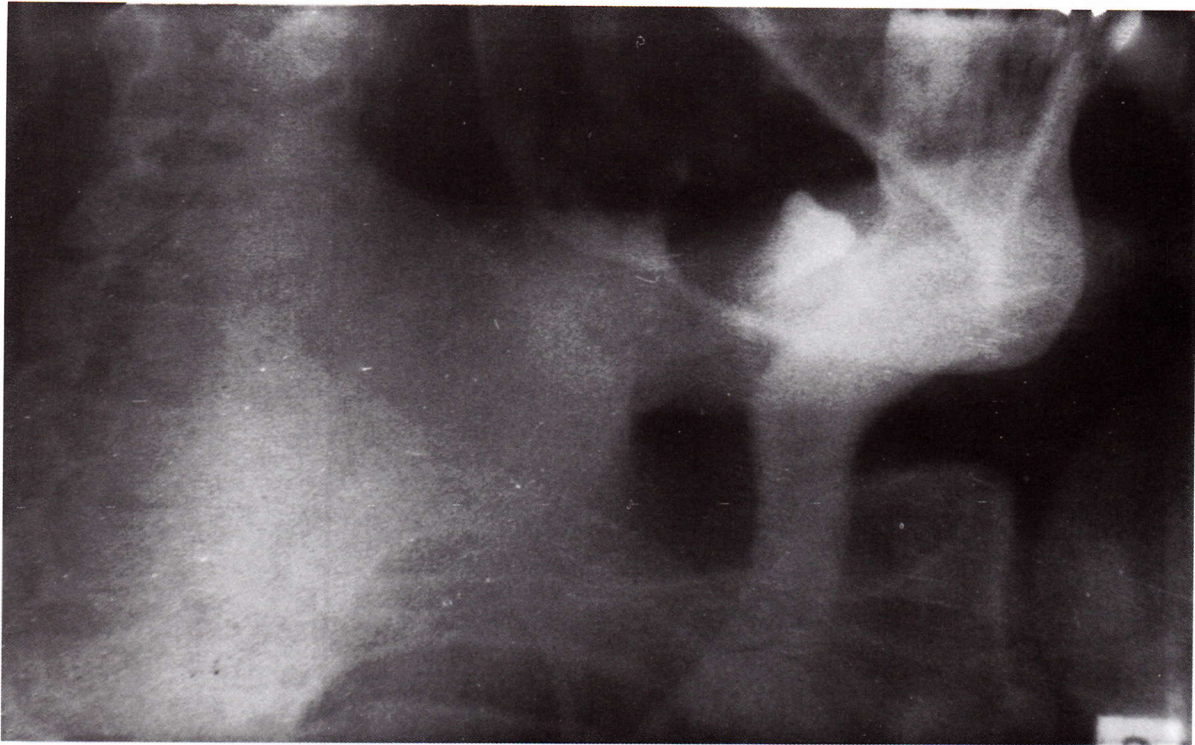
■ Is seen as multilocular cyst at the angle of mandible.

Dental Cyst



■ Is seen as unilocular cyst related to carious tooth.

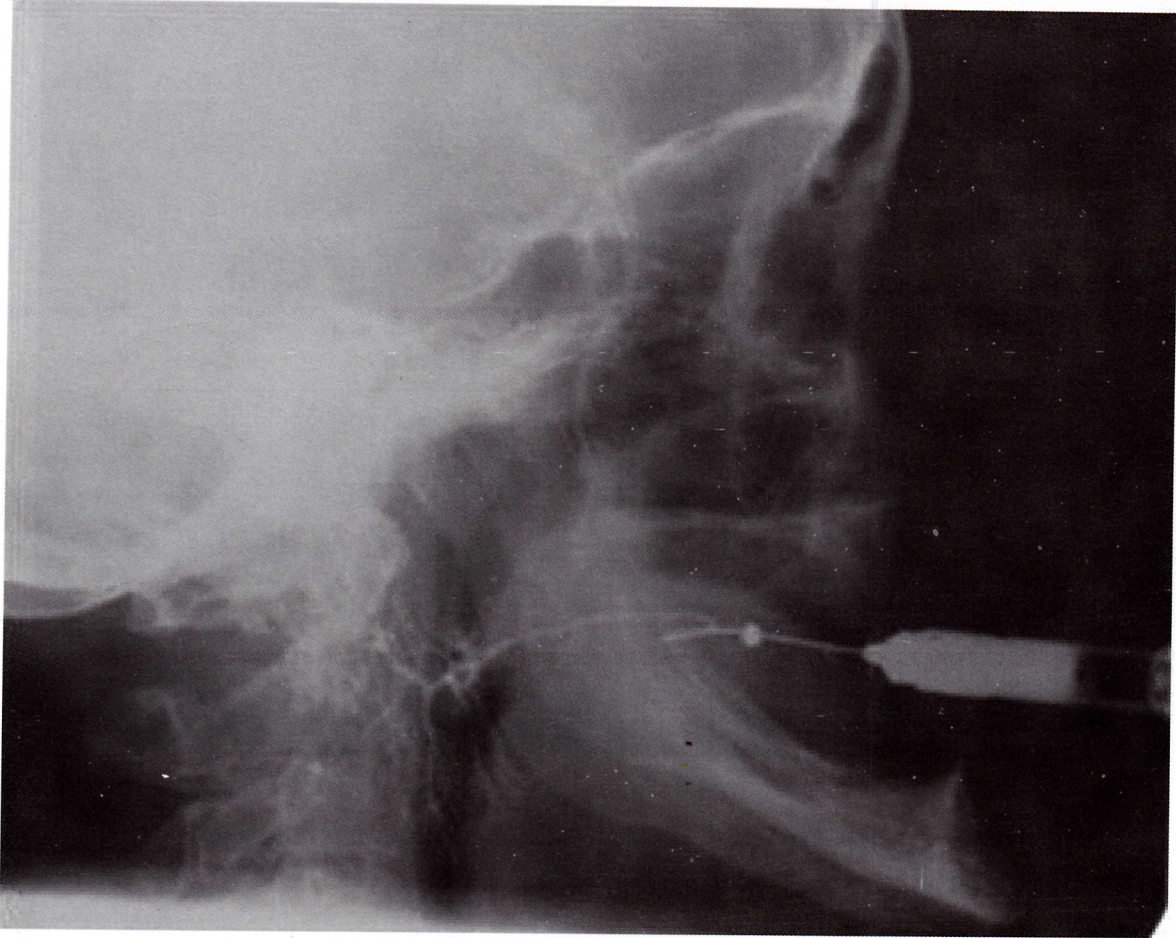
Dentigerous Cyst



■ Is seen as unilocular cyst containing unerupted tooth.

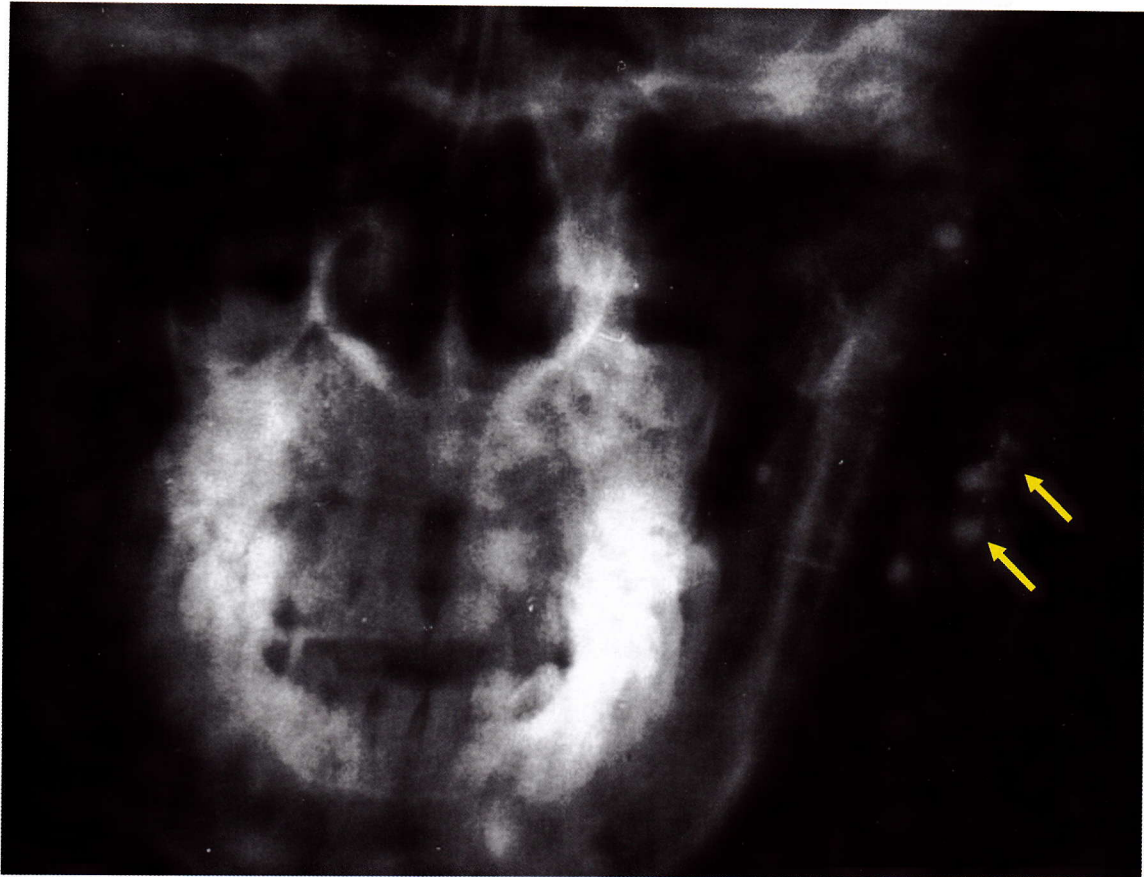
Salivary Glands

Normal Parotid Sialogram



- Showing branches of the parotid duct which diminishes in size with branching.

Sialectesis

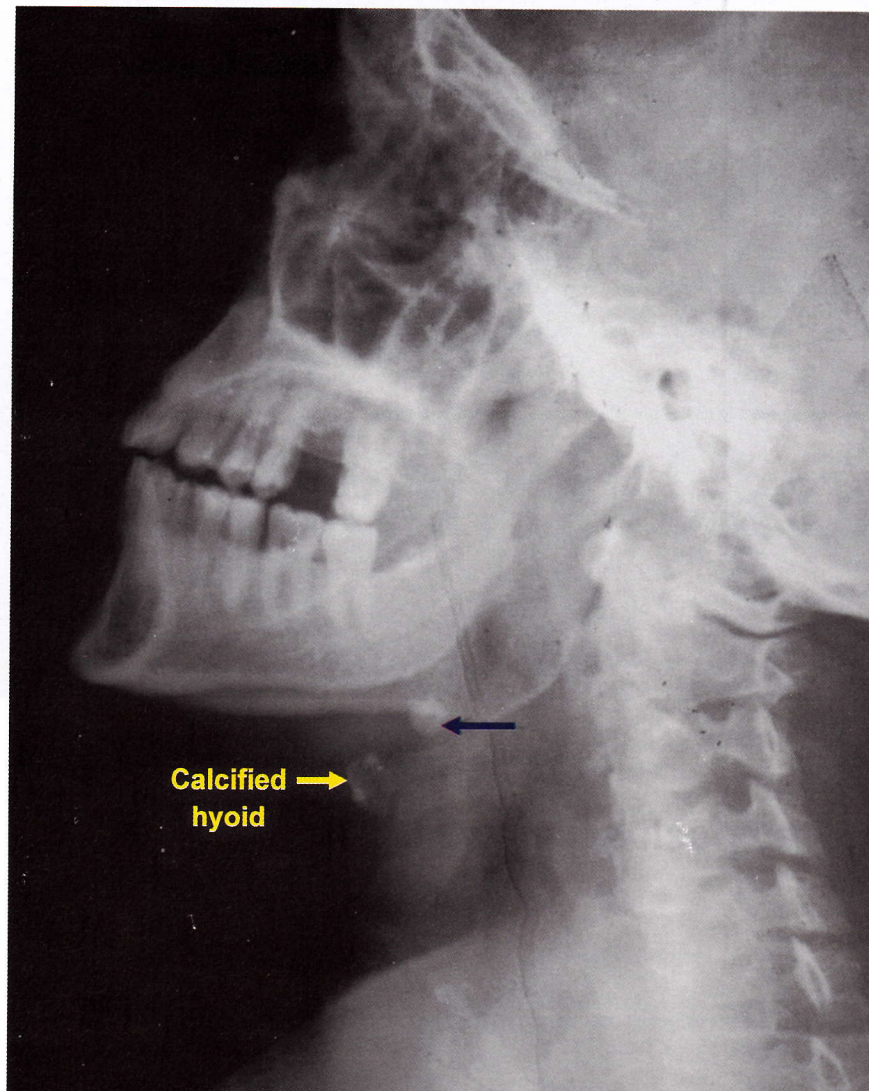


■ Showing branches of the parotid duct which get bigger with branching.

Questions

1. The contrast material used in this condition is lipidol. T
2. This condition is presented clinically with recurrent sialadenitis. T
3. Radiological sign seen is snow storm appearance. T
4. The main line of treatment for this condition is conservative treatment. T

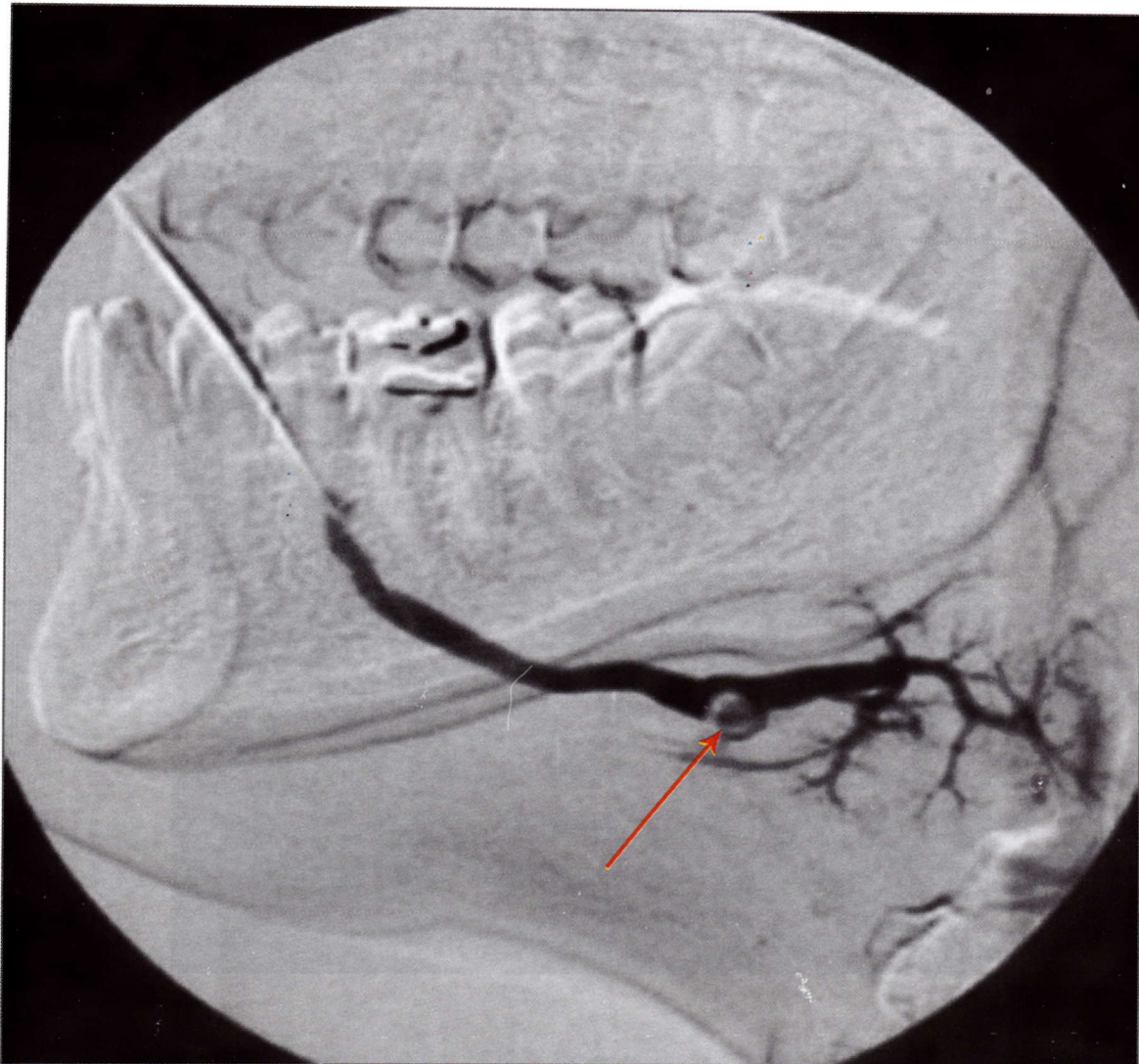
Submandibular Salivary Stone



■ Plain x-ray lateral view skull.



■ Plain x-ray occlusal view.

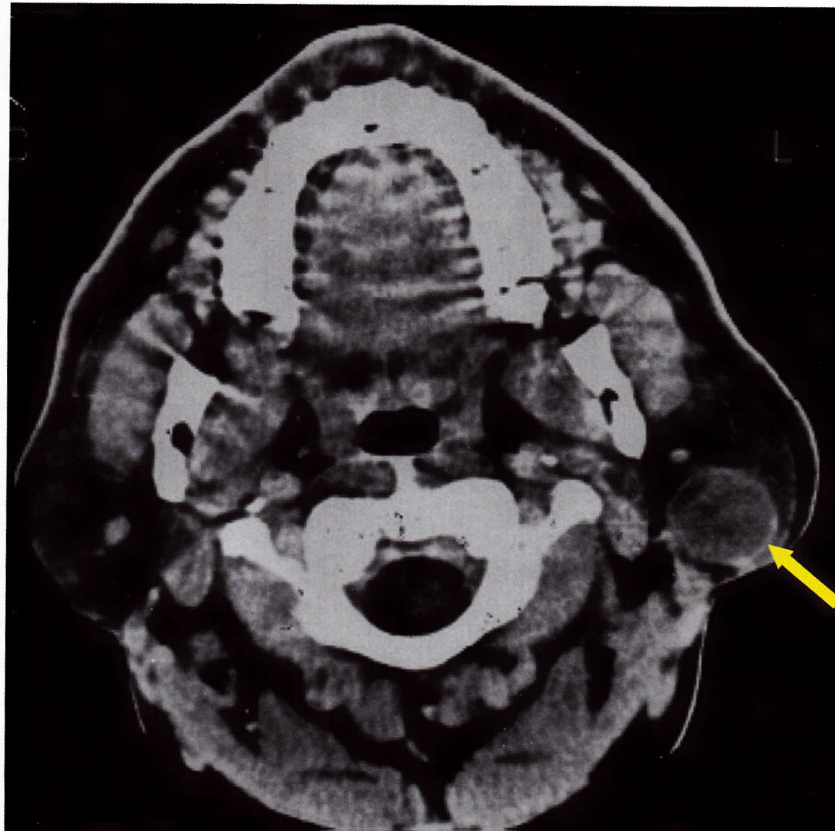


■ **Sialography with digital subtraction showing submandibular duct stone.**

Questions

1. Occlusal view is the best view to detect submandibular stone. T
2. Submandibular stones represent about 80% of salivary stones. T
3. Complete obstruction of submandibular duct causes pain & swelling of submandibular gland before or during meals. T
4. Treatment of choice for submandibular gland stone is surgical removal of the gland. T

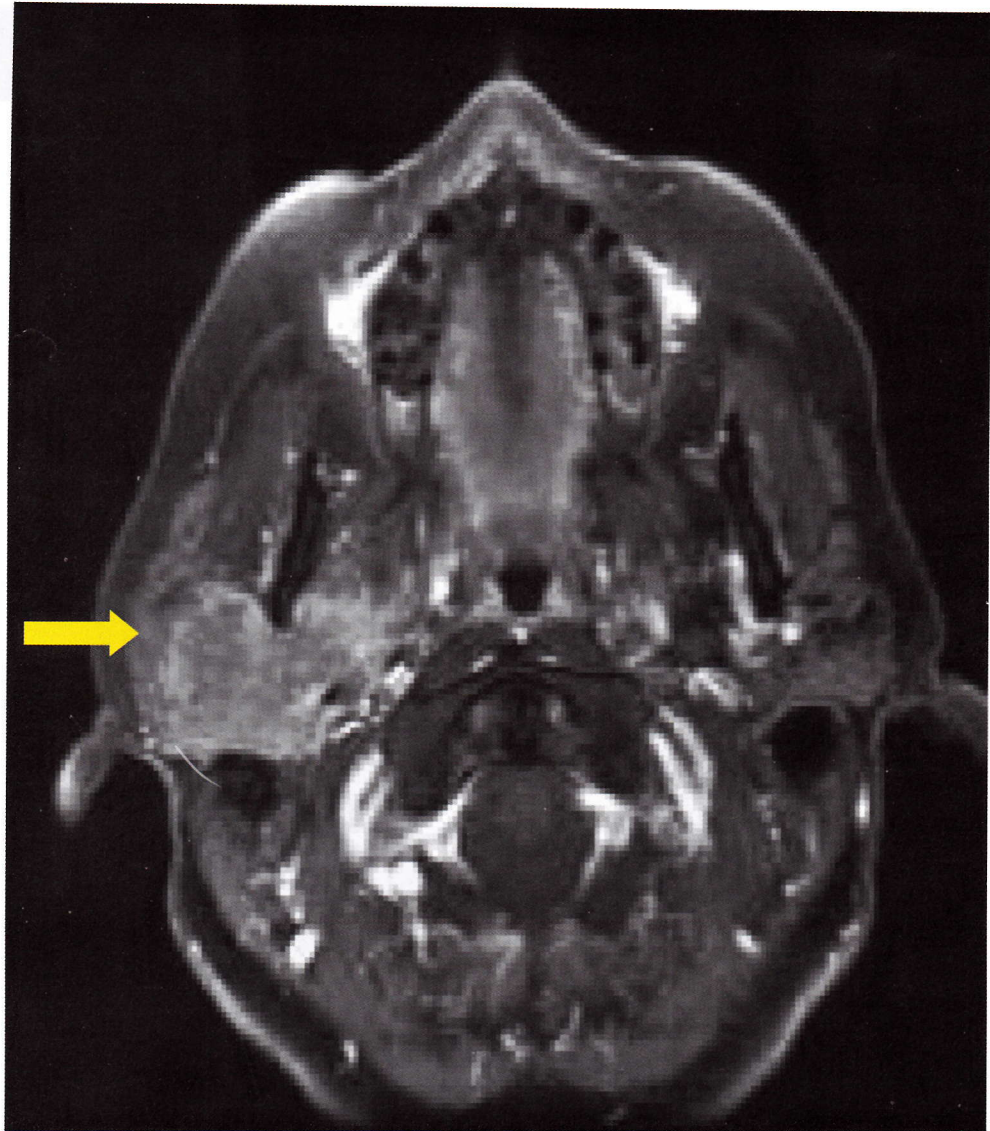
Salivary Tumors



■ **Pleomorphic adenoma CT scan seen as well defined mass mostly in the parotid gland.**

Questions

1. The mass seen is mostly malignant. **F**
2. Surgical enucleation is enough for removal of this condition. **F**
3. Superficial conservative parotidectomy is the treatment of choice for this condition. **T**



- **MRI showing malignancy of parotid gland seen as ill defined mass extending into both superficial & deep lobes.**

Thyroid

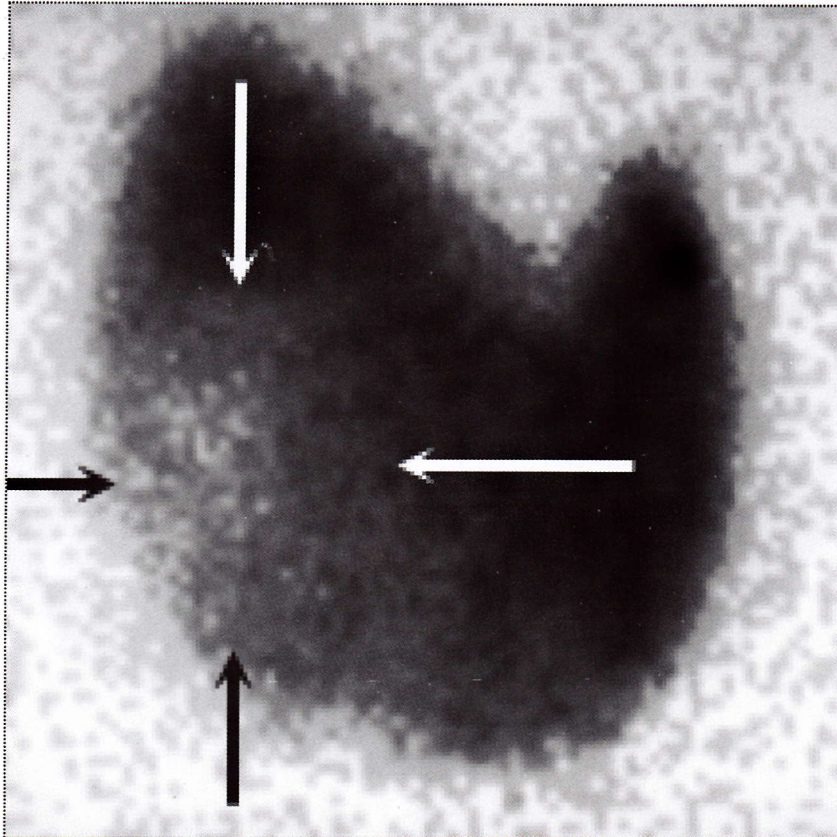
Normal Thyroid Isotope Scan



Cold Nodule

→ For differential diagnosis:

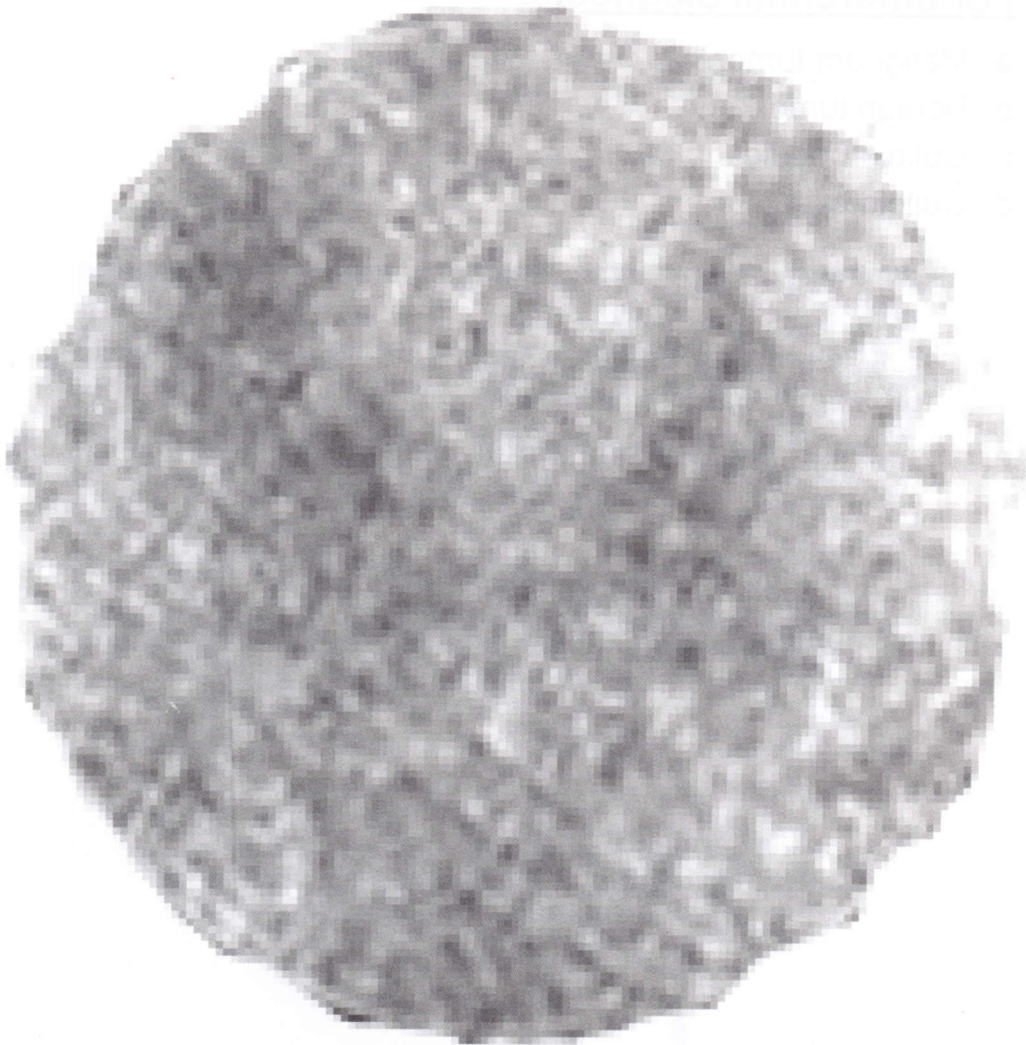
- a. Malignant tumor.
- b. Benign tumor.
- c. Colloid nodule.
- d. Colloid cyst.



Questions

- | | |
|---|---|
| 1. The main cause of this condition is simple nodular goiter. | T |
| 2. Fine needle aspiration cytology is indicated for this condition. | T |
| 3. Ultrasound can differentiate solid lesions from cystic lesions. | T |
| 4. Radioactive iodine is the main line of treatment for this condition. | F |
| 5. Surgery is the principle line of treatment for this condition. | T |

Thyroiditis



■ Showing diffuse low uptake of radioactive iodine.

Grave's Disease



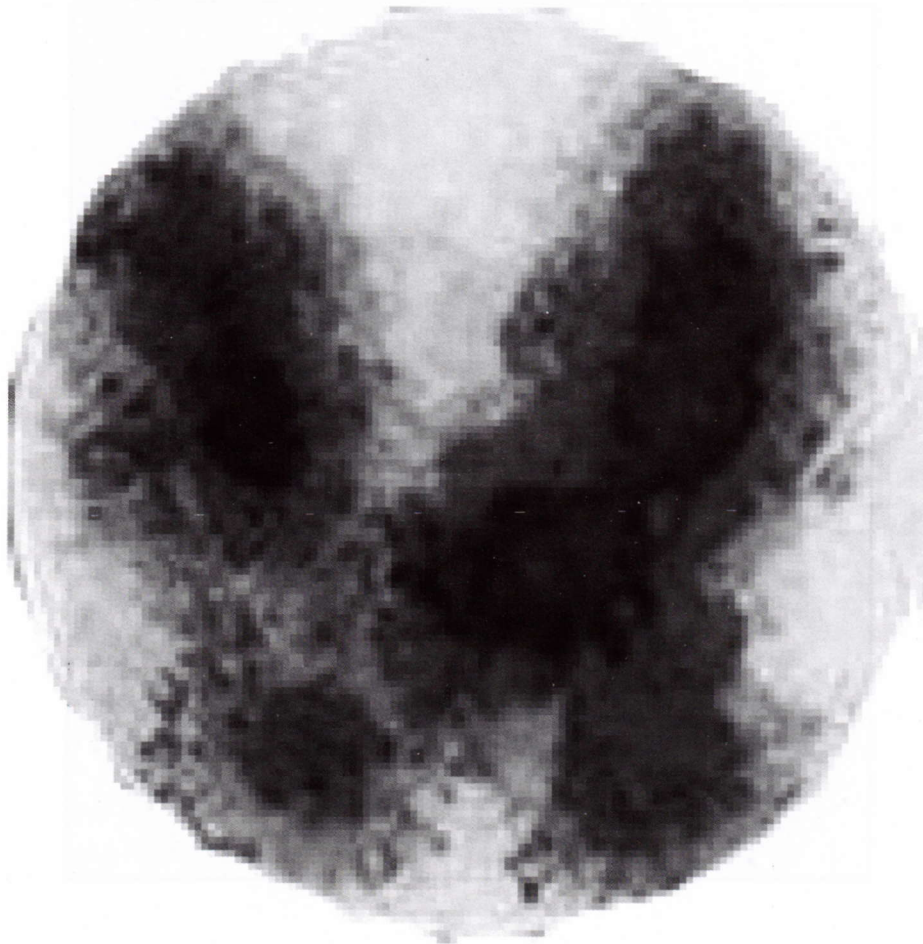
- Showing diffuse intense increased uptake of radioactive iodine.

Questions

1. This disease is due to autoimmune condition.
2. This condition may be associated with true exophthalmos.
3. Medical treatment should be tried first.

T
T
T

Toxic Multi-nodular Goiter



■ Showing areas of increased uptake & areas of decreased uptake (hot & cold areas) with uneven uptake.

Questions

1. This patient is presented clinically with manifestations of thyrotoxicosis. T
2. Palpation of the gland may reveal dominant nodule or multiple nodules. T
3. Surgical treatment is the treatment of choice for this condition. T

Toxic Adenoma



- Showing increased uptake in a single nodule with suppression of the rest of the gland.

Questions

1. This condition is mostly malignant.
2. Estimation of serum T3, T4 & TSH can help the diagnosis.
3. Radiotherapy is reserved for complicated cases only.

F
T
F